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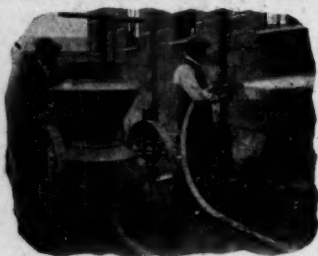
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Railway Age Gazette

Volume 66

April 7, 1916

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The active buying of cars and locomotives still continues despite the high prices for material. In the *Railway Age*

Another Big Week

Gazette of March 31, there were reported in the Equipment and Supplies column, the barometer of the railway supply field, orders for 128 locomotives, 4,250 freight cars and 100 passenger cars, having a total value of at least \$10,000,000. There were also reported orders for 154,000 tons of rails, worth at least \$4,500,000, or total purchases for the week of \$14,550,000. The total purchases of cars and locomotives reported in the five issues of the *Railway Age Gazette* for March are likewise interesting, for there were noticed orders for domestic use alone for 634 locomotives, 14,233 freight cars and 152 passenger cars. It is of special interest, further, to make the following comparison of orders in the first three months of 1916 with those in the corresponding period of 1915:

	1916	1915
Locomotives.....	1,137	181
Freight cars.....	38,169	8,943
Passenger cars.....	537	696

The buying of locomotives has been especially active even though during the last two years or more the railways have been increasing the capacity of their old engines by the application of superheaters, brick arches, new valve gear and other devices. The orders for the first three months of 1916 have been over six times as great as those in the same period for 1915. January, February and March are usually not considered big months, and yet orders have been placed during the first quarter of the year at a rate for the entire twelve months of 4,548, not counting foreign orders. The largest number of locomotives ever reported as purchased during one year was 4,514 in 1912. In short, 1916 bids fair to break a record.

Reports of monthly earnings for February are beginning to come in and on the western roads the indications are that

A Word of Caution

February, 1916, will show as big an increase over February, 1915, as did January, 1916, over January, 1915. Operating expenses, however, are beginning to mount, so that net does not make the same strikingly favorable comparison with 1915 as it did in the last two months previous. The Southern

Pacific has adopted a new form of reporting monthly earnings which is a healthful reminder that comparisons between 1916 and 1915 should be made with the fact in mind that there is a very long way to go between 1915 and a normal rate of business. The Southern Pacific shows operating income in February for each of the last five years as a supplemental statement to its monthly earnings report for February, 1916. Operating income in February, 1916, was \$2,493,000, an increase as compared with 1915 of \$230,000, or over 10 per cent. The February, 1916, operating income is over 30 per cent greater than the February, 1914 income; about 5 per cent greater than the February, 1913, income, but actually less than either the 1912 or the 1911 February operating income. It should be remembered, of course, that the large credit balance for per diem which most of the western roads are earning is not being shown in their monthly statements, so that to this extent the operating income for roads like the Southern Pacific and the Santa Fe are not a full measure of the increased returns which these properties are earning. On the other hand, the monthly statements of the eastern roads—Pennsylvania, New York Central, New York, New Haven & Hartford, etc.—are not showing the debit balances for per diem which are running so heavily against them. All of these things should be borne in mind when making comparisons between present railroad earnings and conditions a year ago.

In view of the unusual increases in the cost of practically all steel products other than rails during recent months it is

Rail Prices and the Steel Market

important to note that the basic prices of \$28 for Bessemer and \$30 for open hearth rails are still in force. The quotations for rails stand practically alone in this regard. When the prices of steel products were below normal during the recent depression in business there was considerable criticism of the steel mills in some quarters because of their refusal to lower the price of rails in keeping with the reduction in the quotations for structural and other steel materials. At the present time, when the reverse condition exists, and the quotations for rails have remained stationary in the face of rapidly increasing prices for practically all other steel products, corresponding credit should be given to the rail manufacturers. There have been rumors that some of the manufacturers are

planning to increase the price of rails in the near future to bring them on a parity with other steel materials, but the fact that orders for nearly one million tons were placed during March at the old quotations for delivery during 1917, indicates that it is not intended to make this raise to domestic consumers. Assuming that the figure fixed is fair, the policy of maintaining uniform prices for materials has several advantages. When quotations on materials are forced down in times of dull business, railway traffic is normally light, the earnings of the roads are decreased and their ability to buy rails and other materials is curtailed. When business returns to normal and earnings increase, enabling the roads to purchase more liberally, the mills are also usually busy and the cost of steel products normally rises. Thus since the railways are unable to buy rails during times of depression, it is of considerable advantage to them to be able to buy them at normal prices in times of good business, and probably they are ahead in the end. When discussing the arbitrary maintenance of price it is well to remember that a policy of maintaining stability is not wrong in itself, but if properly carried out, has much to commend it.

WHAT WILL THE GOVERNMENT DO ABOUT IT?

LAST week representatives of members of four of the train service brotherhoods on the same day presented identical demands for the revision of their wage schedules to the managements of all the railways in the United States. This event marked the beginning of a new epoch in the history of the relations between the railways, their employees and the American public.

Until recent years the custom was for the organized employees of each class on a road to present their proposals for the revision of their schedules to the management of that road. Then developed the practice of employees of each class presenting jointly their demands to the managements of groups of railways. Next, different classes, as engineers and firemen, or conductors and trainmen, began jointly to present demands to groups of railways. The advance just made from this policy to that of the engineers, conductors, firemen and brakemen of all the railways jointly and simultaneously presenting identical demands to all of the roads is a very great change. It is indeed revolutionary, and it concerns the public as much as it does the railways and their employees.

It is well known that originally each railway preferred to deal independently with its own men. The policy of the labor brotherhoods was responsible for the abolition of this practice. It also has been the policy of the labor brotherhoods which has made the collective movements on the part of the employees, and in consequence on the part of the railways, ever larger and larger. There are numerous railway managements which are reluctant at this time to participate in a national movement on the part of the railways to deal with the national movement of the employees. The brotherhoods have made the present controversy a national one; and the railways and the public, whether they want to or not, will have to recognize this fact, and act accordingly.

The situation is truly remarkable. Over 300,000 men, constituting 18 per cent of railway employees and having total wages of almost \$400,000,000 a year, have publicly combined to secure for themselves \$100,000,000 more wages annually. Some of their leaders have publicly declared that they will not arbitrate, but will strike and tie up the entire transportation service of the country if their demands are not granted. Others of their leaders have declared that nobody has a right to say whether they will arbitrate or not. In any event, nobody authorized to speak for them has said that they will arbitrate, and this being the case there is no assurance that they will not strike.

On the other side stand the railways with 622,000 stockholders whose total net dividends in 1914 were only \$340,000,000. If all the stockholders, who are twice as numerous as the train service employees, should, through the managements, combine to make an increase in freight and passenger rates of \$100,000,000, or any other amount, without submitting it to the Interstate Commerce Commission, they would violate the Sherman anti-trust law and the act to regulate commerce and bring down upon the railways and their officers the pains and penalties of both laws.

It is, we repeat, a remarkable situation. The employees can legally combine to secure any increase in wages they see fit, can refuse to submit their demands to arbitration, and to enforce them can tie up every foot of railway in the country, thereby completely depriving the public of the opportunity to get transportation at any price. The owners and managers, on the other hand, are tied hand and foot by laws and public opinion which prohibit them from combining to make the slightest raise in the rates from which wages must be paid, or from locking the employees out and stopping transportation for a single hour. Our boasted government of laws and vaunted democratic equality have come to a fine pass when such a condition of affairs can exist!

But the condition exists and must be dealt with. And the *Railway Age Gazette* believes that it is very fortunate for both the railways and the public that the train service brotherhoods, led by men strangely deficient in foresight, have precipitated such a situation. Under the policy formerly followed by these brotherhoods, of making demands upon the railways of one territory and then upon those of another, they succeeded in incorporating in the wage schedules some provisions of the most unreasonable character which in many cases produce the most inconsistent and indefensible results. It was impossible while they followed this policy to arouse the interest of the American public and make it understand just what was going on, and the nature and extent of its own interest in the matter. The brotherhoods, through the folly of their leaders, are now engaged in a movement of such magnitude that the interest of the public can be aroused and that it can be made to understand both the nature and the extent of its interest in the points in controversy. The spokesmen of the brotherhoods, in their efforts to support their demands and to answer the arguments being advanced against them, are showing an extraordinary capacity for using sophistry and half-truths, but thus far they have made a complete failure of their efforts to mislead either the press or the public. The press and the public are showing that they know that the two great questions involved are, first, whether the highest paid classes of workingmen in America shall be given by the railways, ultimately at the expense of the public, an enormous increase in wages, and second, whether if the railways decline to do this the train service employees shall be allowed to refuse to arbitrate and to strike, thereby paralyzing the commerce and industry of the entire nation.

The train service brotherhoods have deliberately chosen to support their demands for higher wages by a nation wide movement. They have thereby made the question presented one of national importance, and, consequently one for the nation to settle. The representatives of the nation are the officials of the government at Washington. Therefore, what shall be done about the entire matter is squarely up to Congress and to the President and his advisers. The railways cannot, in justice to the public, which ultimately would have to pay the bill, grant the demands, or any of them, without previous arbitration. Therefore, there will either be arbitration or a nation wide strike. If there is to be arbitration it should be of such character and by such a tribunal as will insure the protection of the interests of all concerned, including not only the train service employees and the railways, but also all the other railway employees and the public.

The situation is at once one of the most anomalous and

most menacing to the material welfare of the nation that ever existed. It is amazing that over 300,000 men can publicly combine to demand \$100,000,000 a year more from their employers and the public and threaten to paralyze the industry of the country if they do not get it, and all this without any legal interference whatever. The situation is so menacing because these men clearly can do and may do exactly this thing. There is only one power great enough and strong enough to deal with them and that is the government at Washington. What, then, is the government at Washington going to do about it?

THE AMHERST ACCIDENT

SEVERAL possible contributory causes of the catastrophe involving three fast passenger trains on the New York Central near Amherst, Ohio, on March 29, are indicated in the detailed article elsewhere in this issue, but the seeker for a remedy to prevent such accidents in the future is met by a blank wall of evidence in almost any direction he may turn. After repeated attempts to solve the baffling problem of the cause of this accident such a seeker would be tempted to conclude that in the present state of the development of human nature it is not possible to provide against the occasional recurrence of such catastrophes. It is instructive, however, to consider briefly the circumstance in this case in order to realize more fully the necessity for still greater effort to reach perfection.

The proximate cause, as nearly as could be determined by the testimony taken in the investigation which followed the accident, was the failure on the part of Engineman Hess, of the train which ran into the one ahead, to read a signal properly. He testifies that he received a clear indication at the distant signal approaching the Amherst interlocking plant, while all of the evidence indicates that this signal must have been at danger. The fireman corroborates Hess's testimony, since he swears that he heard the engineer call the signal white. There can be no question that Hess was convinced that he had a clear signal, for he ran his train about three-quarters of a mile under a full head of steam before he struck the section ahead. His record had been good except in minor details, and he had been disciplined in those instances; he was thoroughly competent and experienced, was in the best of health, had enjoyed an ample rest period before starting on the run, and his eyes had always tested perfect. It is difficult to see how any amount or degree of discipline could prevent such an engineman from erring.

It required the simultaneous occurrence of two other conditions, however, to produce the accident and of several others to make the consequences as serious as they were. In the first place, train first No. 86 was stopped unnecessarily through a failure either of the towerman or of the signal system. Unless the tests now being made develop some unsuspected condition, it will appear probable that this, also, was a human failure. The system is designed to protect against such failures, however, and if the automatic signals guarding the rear of the train had been properly displayed, properly read, and properly obeyed, the accident could not have occurred. The most serious result of such a failure as that of Towerman Ernst under ordinary conditions would be a few minutes' delay to the train.

The first train being stopped and the engineer of the second train having misread the signal protecting it, the only individual who could have prevented the collision was the flagman of the first train. His testimony indicates that he lived up very closely to both the spirit and the letter of the flagging rule, and that under the conditions of operation on this line the rule is probably as good as can be framed. Stricter discipline therefore, would not have given the flagman an intuitive knowledge that the following train would overrun the stop signal.

If the damage had been confined to that caused by the rear collision, it is probable that a majority of those killed would have been spared. The chances of a fast train on the adjacent track being too near the scene of the collision to be stopped were extremely slight, and being in that position, it is not conceivable that any known safety device or precaution could have prevented the damage done by this third train.

It is barely possible, but hardly probable, that the Interstate Commerce Commission, by means of tests now under way, will develop a plausible explanation for the sudden and complete failure of the signal protection which must have occurred if the testimony of Engineman Hess and Towerman Ernst is correct. However, if it is assumed that such a condition did exist at the time of the accident, it is fair to say that no officer or employee of the company could be blamed, for the records show that the signal protection in service at this point is probably as good as could be secured and was being maintained as well as the present state of the art would permit. It is not unlikely that some additional protection, by automatic devices, can be worked out for situations of this kind, but the difficulties confronting signal and operating men in the application of such devices must not be lost sight of.

The testimony of operating officers on the division where this accident occurred, shows that every effort had been made to promote safety. Enginemen had been cautioned not to sacrifice safety for speed and within a few months every passenger engineman on the division had been individually cautioned to use particular care in observing signals. Surprise tests are frequently made and the standard of safety which has been established shows that these precautions have produced results.

It is an axiom in designing signaling systems that the practical limit of complication has been reached when two or more simultaneous abnormal conditions are required to produce a failure. Such a combination of circumstances existed at Amherst in this case, and in the face of such an array of adverse conditions it is difficult to understand how they could all have been provided against. The only consoling thought is that such combinations cannot happen with any degree of frequency and that by constantly increasing the efficiency of men and machines the periods between such catastrophes can be still further increased.

SHOULD THE ROCK ISLAND BE SOLD UNDER FORECLOSURE?

ON April 1 the interest due on the Chicago, Rock Island & Pacific first and refunding 4 per cent bonds was paid by the receiver, thus preventing for the time being the sale of the property under foreclosure of the mortgage securing these bonds. The protective committee for the refunding bonds, of which Charles A. Peabody is chairman, opposed the issue of receiver's certificates even for the purpose of paying interest on the bonds which the committee represents. Judge Carpenter, in authorizing the receiver to take the necessary steps to pay the interest on the refunding bonds, criticized the attitude taken by the protective committee and gave it as his opinion that it would be quite unjust to the stockholders to permit a foreclosure of the refunding mortgage so long as the company had surplus earnings sufficient to pay the interest and thus prevent the possible loss of the equity which the holders of securities junior to the first and refunding mortgage had in the property. These junior securities consist of \$20,000,000 debenture bonds and the \$75,000,000 stock. The surplus which Judge Carpenter mentioned is a bookkeeping matter and he failed to comment specifically on the cash position in which the receiver finds himself. As of February 17, 1916, a

statement was prepared by the receiver of the Chicago, Rock Island & Pacific, which was submitted to Judge Carpenter, showing the estimated cash receipts and disbursements February 1 to July 1, 1916. There was cash on hand amounting to \$1,035,468. The estimated cash receipts from operations were \$28,275,000 and the expenses to be deducted therefrom \$20,824,000. After the payment of interest charges and taxes, but before the payment of any interest charges on the \$20,000,000 debentures, it is estimated that there would be a net cash deficit in excess of normal working cash of \$1,885,367. It would appear, therefore, that the only steps which the receiver could take to pay the interest due April 1 on the first and refunding bonds would be the further issue of receiver's certificates. There are two trustees for the first and refunding bonds—the Central Trust Company of New York and David R. Francis of St. Louis. Mr. Francis has just been appointed ambassador to Russia. The Central Trust Company and the protective committee of which Mr. Peabody is chairman are acting in harmony in regard to desiring apparently a foreclosure sale of the Rock Island under the foreclosure of the first and refunding mortgage. Mr. Francis is of the opinion that no such foreclosure is necessary, and this difference of opinion has led to the interchange and publication of some rather bitter letters in which Mr. Peabody points out that Mr. Francis is the owner of junior securities and expresses the opinion that he ought not to represent as trustee the interests of the first and refunding mortgage bondholders, and in which Mr. Francis intimates that the committee desires a foreclosure sale under the refunding mortgage and a consequent wiping out of junior securities interests, not so much because the refunding mortgage bond interest is in danger as for other reasons. This controversy and Judge Carpenter's criticism of the Peabody committee are of especial interest because they are apparently the expression of honestly held but radically different points of view. In this connection may also be considered the severe criticisms which have appeared in the Wall Street Journal in regard to the efficiency of the former management of the Chicago, Rock Island & Pacific.

The opinion on which the N. L. Amster faction and Mr. Amster's stockholders' protective committee base their belief that with efficient management, all of the securityholders of the company can eventually come out with a whole skin and the company be put on a sound basis without foreclosure sale is itself based on the assumption that the difference between efficient operation and the operation under the former management is sufficiently great to pay all interest charges and to give the company a credit to refund maturing obligations. If this opinion were sound it would be necessary to raise only such new capital as is required to refund maturing securities and indebtedness, and the capital expenditures for additions and for betterments recommended in the Kendrick report could be postponed until a considerable part of them can be made piecemeal from surplus earnings.

The opposite opinion is founded on a belief that such a course would be impracticable, in that there is not a great enough margin between possible operating efficiency with present facilities and past practice to provide working capital and interest charges and that the necessary cash for refunding cannot be raised and that it is a mistake to carry on operations through the issue of receiver's certificates.

The Peabody committee would probably acknowledge that there is a fairly large equity over and above their claims, but they believe apparently that the best way to materialize this equity is to reorganize by raising new capital through an assessment on the stock, cut down fixed charges by a compulsory exchange of debentures for non-fixed charge bearing securities, and a probable elimination of the clause in the

refunding mortgage which prevents future financing by the issue of mortgage bonds.

The situation is analogous to that which has faced many a solvent railroad company in the past in relation to its payment of dividends. The accounts kept in accordance with the Interstate Commerce Commission's theories of accounting show a surplus available for dividends. The cash to make this dividend distribution, however, must be raised through the issue of capital securities, because the cash excess of receipts over operating expenses, taxes and interest have perforce been put into the property for what the Interstate Commerce Commission classifies as additions and betterments. In general it has been found to be a sound principle of railroading to pass the dividends and not to issue capital securities against additions and betterments in a case like this, and an analogous course with the Rock Island would lead to a foreclosure either under the debenture or under the first and refunding mortgage. Increased efficiency in operation might conceivably stave off actual foreclosure and with a long period of uninterrupted prosperity the Rock Island might be brought back to a decent financial credit and the equity of the junior securityholders materialized without foreclosure sale or assessment; but it is a question whether or not these results could not be much more quickly and far more surely obtained by a foreclosure sale and an assessment. Stockholders unable to pay the assessment could be protected by some such arrangement as is provided for in the Boston & Maine reorganization, where if they do not wish to pay their assessment they can relinquish a certain proportion of their present holding of stock and still retain unimpaired the equity represented by their remaining holdings.

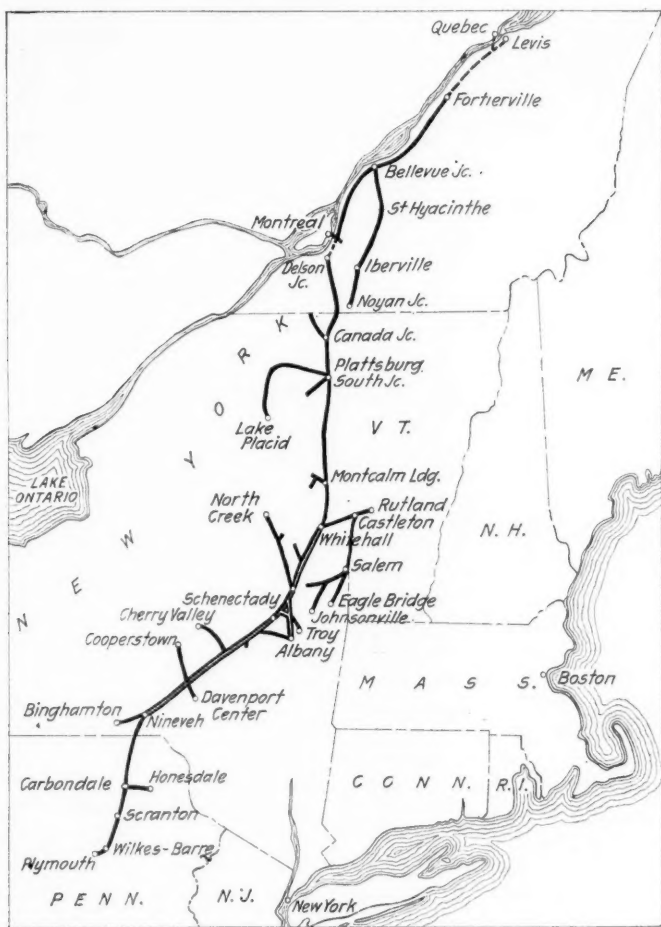
DELAWARE & HUDSON

FOR a single year the Delaware & Hudson had the additional revenue accruing from the Interstate Commerce Commission's decision in the eastern 5 per cent rate advance case and had not begun to suffer the loss in revenue which will result from the orders of the commission reducing anthracite rates. Even so, however, the addition to the company's revenue from the advanced rates amounted to only about 2 per cent and the gratifying results which were obtained in net corporate income, which amounted to \$6,071,000 in the calendar year 1915, as compared with \$4,610,000 in 1914, were brought about largely by an increased tonnage of freight business handled, with a decreased expenditure of train miles. The average freight trainload in 1915 was 653 tons, comparing with 579 tons in 1914, an increase of 74 tons, or 12.64 per cent. The total ton mileage of revenue freight in 1915 was 2,879,000,000, an increase of 147,000,000. The mileage made by revenue freight trains was 4,691,000, a decrease of 384,000. Transportation expenses—the out of pocket cost of moving freight and passenger business—amounted to \$8,008,000 in 1915, a decrease as compared with the previous year of \$587,000. The average trainload in 1915 was nearly 41 per cent greater than the average trainload in 1910.

Economies which this comparison between 1915 and 1910 shows have taken place are in large measure proof of the wisdom of expenditures which have been made for heavier locomotives and for strengthening bridges and other structures to make safe or facilitate the operation of heavier trains. The remarkably good comparison which the 1915 trainload and expenses made with 1914 is in part due to the same causes and in part to better supervision. There were no changes made in the number of locomotives in service, although during the year there were a number of locomotives taken into active service which, while nominally in service in the previous year, were actually standing idle in white lead. There was some improvement in the hauling capacity

of locomotives due to the equipment of a considerable number with superheaters; but beside this improvement in mechanical tools of operation there was another factor which contributed to the reduction in transportation expenses and increase in trainload. This was better supervision. The largest gains that were made in trainloading were on the Susquehanna division, and on this division Mallets which had been in pusher service were replaced with lighter engines, so that it is safe to say that the greater part of the increased trainloading on this division was due to a more skillful use of facilities.

The reduction in transportation expenses would have been even greater than it was had not the cost of fuel per ton been higher in 1915 than in 1914, due to causes beyond the control of the operating department. While there was a reduction of 13 per cent in wages paid train-enginemen, there



The Delaware & Hudson

was a reduction of only 8 per cent in the cost of fuel for train-locomotives.

While it is unquestionably true that railroad employees individually do less work now than they did 10 or 15 years ago, it is equally true that along with improved mechanical devices has gone on most roads an education of the operating officers in the science of railroading; this is certainly true on the Delaware & Hudson. A company which, like the Delaware & Hudson, has offset the increased pay of employees and decreased efficiency, has done so through the expenditure of new capital and through the increased effectiveness of the work being done by the management, and management in this sense means officers all down the line to the trainmaster. On the Susquehanna division there are opportunities for still further gains in trainloading by the expenditure of additional capital for grade reduction.

In addition to expenditure which are made with the pur-

pose of reducing operating costs or offsetting increases in these costs which cannot be avoided, nearly every railroad is making more or less considerable expenditures for purposes which do not contribute directly toward profit to stockholders but which are of the greatest importance and interest to the public served by the road.

The Delaware & Hudson in 1915 operated 909 miles of railroad. Only five miles of road was added as compared with 1914, and as was previously noted, there was no change in the number of locomotives and only minor changes in the number of passenger and freight cars. There were, however, some interesting additions to facilities which directly affect the quality of freight or passenger service and which are part of the railroad company's contribution toward the progress in the growth of the community served. Most important of these, in that it represents the largest amount of money, was the opening of the Wilkes-Barre Connecting Railroad. This is a 7-mile line through the outskirts of Wilkes-Barre, Pa., which gives the Delaware & Hudson a direct connection with the Pennsylvania. This both eliminates the necessity of using trackage rights over the Lehigh Valley and greatly facilitates freight service. The cost of this 7 miles was over \$2,200,000, all of which, or almost all of which, went to property holders in Wilkes-Barre or to local labor. This line was opened in March, 1915.

The new freight station and the new office building of the Delaware & Hudson in Albany were opened in 1915. The freight station is conveniently located for both shippers and for operation by the railroad. The new office building is a handsome structure, worthy of the capital city of the state of New York. A new passenger station was built at Bainbridge, N. Y., and another one at Cooperstown. At Bainbridge there has been grade crossing elimination work going on during the year, and three grade crossings are being eliminated at Castleton, Vt., and Poughkeepsie. There was \$70,574 spent in the work of adding yard facilities at Carbondale, and passing tracks at certain other points are being extended. The entire main line of the Delaware & Hudson is now equipped with automatic block signals.

Additional and betterment work, such as the Delaware & Hudson is carrying on, involves the expenditure of considerable sums which are charged to operating expenses as well as the amounts charged to capital account. Nearly all of these expenditures, as well as a very large part of the total expenses of operation and maintenance of the railroad, goes directly into the pockets of the people living along the lines of the railroad. On the other hand, much of the revenue received by the road is derived from the transportation of coal, which transportation charges are paid not by the people living along the line of the road, but by consumers or manufacturers in other parts of the United States. Few people stop to realize how valuable a citizen in their community the railroad is. Especially is this so of a road on which a large proportion of the freight revenue is paid by shippers or consignees off the road and a considerable part of the passenger business is made up of travel by people who come into that territory to spend their vacations.

The industrial department of the Delaware & Hudson is constantly engaged in trying to locate new industries along the company's lines, adding, of course, not only to the railroad company's traffic but also to the wealth of the community. In 1915 there were 93 new industries located on the lines of the company.

Passenger business in 1915 amounted to \$2,776,000, a decrease as compared with the previous year of \$172,000. The continued growth in the use of automobiles makes serious inroads into the Delaware & Hudson's passenger revenue. The company's hotels in the Adirondacks and on Lake George did as large a business as ever, but a larger proportion of the patrons of these hotels travel from their home cities in automobiles. Another factor which probably

has a considerable effect on decreasing passenger business is the use of the telephone. Traveling men can now call up half a dozen customers in a day, the telephone charges in each case probably not being much more than the railroad fare would have been. The time saved is large, but the loss to the railroad company is reflected in the downward trend of passenger earnings.

Inadequate railway mail pay also tends to make the operation of passenger trains less profitable, and in this connection it must be remembered that increases in parcels post, while not being paid for at all by the government, are subtracted from the revenues from the carriage of express. The National Express Company operates over the Delaware & Hudson and heretofore payment to the railroad company had been made on a proportion of gross receipts basis. The railroad company agreed, however, temporarily to try out a plan of payment on a mileage basis, which basis yielded the railroad about the same return for the same amount of traffic handled, but through simplification of accounting methods is more economical to the express company. Of course this, while helping the express company, did not do anything to offset the loss due to the shipment of packages by parcels post that would have gone formerly as express matter.

The Interstate Commerce Commission is to value the Delaware & Hudson as of July 1, 1916. For more than a year the company has had an organization of its own officers which has been collecting data to be used in this work. This will greatly facilitate the work of the commission's engineers, and will also assure an accuracy which is of the greatest importance to the company's securityholders.

The Delaware & Hudson is one of the oldest railroad companies in the country. The 1915 annual report is the eighty-sixth report of the company and the work preparatory to the valuation includes not only an estimate of the cost of reproduction new of all of the assets, but also a search through old files to establish so far as is possible the historical cost of these assets. While it is rather hard to see a justification for the expenditure which the government will have to make to get a valuation of such a road as the Delaware & Hudson—there is every indication that the cost of reproduction new and the cost as shown by the historical record will both be much higher than the cost of assets as shown by the company's books. The expenditures which are being made by the company are not by any means being wholly thrown away. The data collected will quite possibly be found of considerable value in giving the management a more complete knowledge of the facilities and assets with which it has to work.

The Delaware & Hudson has two departments—a coal mining department and a railroad department. The revenues from coal mining amounted to \$15,861,000 in 1915, an increase of \$344,000 over 1914. The expenses amounted to \$14,617,000, an increase of \$64,000 over 1914. There was 8,101,000 tons of coal mined, an increase over 1914 of 700,000. The reason that the tonnage mined showed a larger proportionate increase over 1914 than did revenue was because a fairly large amount of coal was stored against the possibility of a strike.

The Delaware & Hudson is in a strong position as regards working capital and the financing of its securities maturing in the near future. It took advantage of the good bond market of the latter half of 1915 to sell \$14,451,000 5 per cent 20-year convertible bonds. This provides cash for the retirement at maturity June 15, 1916, of the entire outstanding \$13,973,000 4 per cent convertible debentures. In addition to the cash for the retirement of these debentures the company had on hand \$2,505,000 cash, an increase as compared with 1914 of \$537,000. During the year the company decreased its loans payable by \$315,000, leaving \$2,704,000 loans payable on December 31, 1915.

President Loree has made a compilation of the securities of American railroads which are still held abroad. His estimates show that as of July 31, 1915, there were railroad securities with a par value of \$2,223,510,229 and a market value of \$1,751,437,913 held abroad. In the period between March 31 and July 31 there had been returned to the American market \$480,892,135 of American railroad securities. The amount of railroad securities maturing in 1916 is \$115,559,429. This is only one-seventh of the amount which came to maturity in 1915. This fact would in part offset the factor of the probability of this market having to take a further volume of European-held railroad securities in addition to having to take all new securities, a part of which would, under the conditions before the war, have been taken by Europe. On the other hand, a large amount of capital of insurance companies, trust companies and other institutions, which is ordinarily loaned as call money or short-term money, is now invested in long-term securities; as soon as call money rates, which are now very low and which have been so for a long time, become higher, the institutions will probably sell their long-term bonds to have money to loan in short-term market. The reduction in amount of securities maturing in 1916 as compared with 1915 should therefore be considered in connection with the other factors in the bond market situation.

The following table shows the principal figures for operation in 1915 as compared with 1914:

	1915	1914
Mileage operated	909	904
Coal freight revenue.....	\$11,311,690	\$10,844,093
Merchandise freight revenue.....	8,788,365	8,133,603
Passenger revenue	2,774,595	2,946,641
Total operating revenues.....	23,787,519	22,722,962
Maintenance of way and structures.....	1,852,166	1,721,507
Maintenance of equipment.....	3,703,382	3,680,235
Traffic expenses	315,992	314,358
Transportation expenses	8,007,980	8,595,112
Miscellaneous expenses	190,758	136,892
General expenses	775,646	760,178
Transportation for investment—Cr.....	22,299	19,431
Total operating expenses.....	14,823,626	15,188,851
Taxes	680,119	671,119
Operating income	8,283,774	6,862,992
Gross railroad income.....	9,356,838	7,981,281
Net railroad income.....	4,515,885	3,171,458
Net income including coal department net....	6,071,441	4,609,794
Dividends	3,825,270	3,825,270
Surplus	2,246,171	784,524

NEW BOOKS

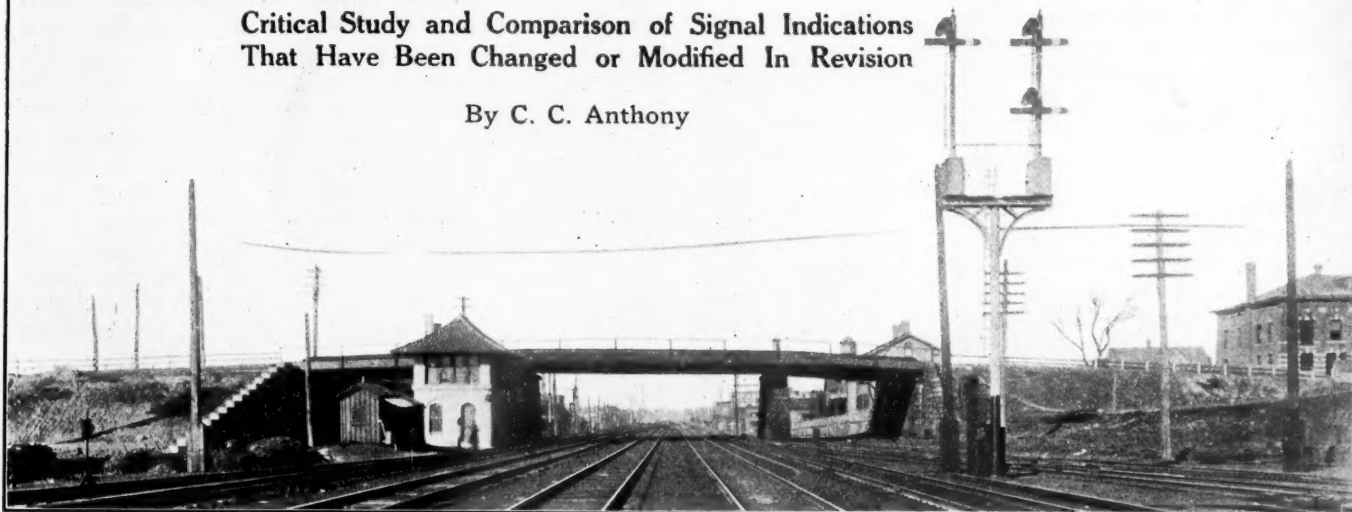
Digest of Workmen's Compensation Laws in the United States and Territories, with Annotations. Fourth edition, revised to December 1, 1915. Compiled by F. Robertson Jones. 73 pages, 9 in. by 10 in. Bound in paper. Published by the Workmen's Compensation Publicity Bureau, 80 Maiden Lane, New York. Price \$2.

In the *Railway Age Gazette* of March 3, page 384, there was published a notice of a book recently issued by the United States Bureau of Labor Statistics, entitled *Compensation Legislation of 1914 and 1915*. This book differs from the government bulletin primarily in that instead of giving the laws themselves it gives a detailed analysis of them and shows in tabular form under 45 headings the essential features of each of the statutes. It is bound and folded in convenient pocket form and contains certain information not given in the other publication. It cites at appropriate places throughout its pages important decisions of courts in the United States, Canada and England bearing upon various disputed points in the compensation laws. Its value as a book of reference is further enhanced by a section giving the names and addresses of members of workmen's compensation commissions, industrial accident boards or other officers supervising the operation of the compensation laws. A map on the front inside cover page shows graphically those states which have compensation laws, those having none and those in which the matter is under consideration.

The Revised Standard Code: Signaling Rules

Critical Study and Comparison of Signal Indications
That Have Been Changed or Modified In Revision

By C. C. Anthony



THE INTERLOCKING RULES.*

There are no changes in the definitions preceding the interlocking rules, until "home signal" is reached. This was formerly "A fixed signal at the point at which trains are required to stop when the route is not clear." The definition is now the same as that for the home block signal, with reference to the route included: "A fixed signal at the entrance of a route or block to govern trains in entering and using said route or block."

The advance signal being eliminated, a distant signal is now "A fixed signal used in connection with one or more home signals to govern the approach thereto."

The only other change is in the definition of dwarf signal. Formerly a low fixed signal, the dwarf is now "a low home signal."

REQUISITES AND ADJUNCTS

The first five requisites are the same as those of the controlled-manual block system (except that No. 5 refers to home signals instead of home block signals). Numbers 6, 7, 8 and 11, block-system requisites, are omitted. New No. 9 was formerly 13, "latch locking, or its equivalent." Assuming that lever locking is an equivalent of latch locking, this requisite is generally complied with.

No. 7, as to interlocked levers, becomes 10 and No. 8, as to interlocking through levers, becomes 12. No. 9, as to failures of parts controlling switches or locks, is eliminated as the point is covered by 16 and 17 as revised.

Requisite 13 (formerly 10), "Locks for all switches," is unqualified. The former requirement was "Facing point locks, or their equivalent, for all switches in main routes."

Requisite 16 (formerly 6) is "The interlocking of signals with switches, locks, railroad crossings, or drawbridges, so that a signal permitting a train to proceed"—instead of a clear-signal—"cannot be displayed unless the route to be used is set"—instead of clear—"and stop-signals displayed for all conflicting routes." The former wording did not take into account the various indications that might be given by a signal besides the one that would make it a "clear signal"; and it implied that the route must be clear (of trains), a condition that cannot well be met by interlocking alone.

Requisite 17 (formerly 14) is considerably changed and shortened. It is practically a repetition of 16 in different

words: "The established order of interlocking such that:

A signal permitting a train to proceed cannot be displayed until the switches in the route to be set are in position and locked; derails, if any, in conflicting routes set to diverge and all opposing or conflicting signals display their most restrictive indication. The display of a signal to proceed shall lock the arrangement." Admitting that there is any need of two requisites so nearly alike, the language of 17 seems to need further revision; among other things, the "route to be set" is probably the route to be used, and "a signal to proceed" is probably a signal permitting a train to proceed.

The adjuncts are rearranged and two new ones are added: (F) "Track circuits," and (J) "Take siding indicators." Adjunct E (formerly D), as to bolt-locking or its equivalent, now reads, "The locking of switches by signals." Screw releases, R (formerly M), have become time releases—a more general and appropriate term.

RULES

Passing over the rules that give the signal indications and aspects, the most notable change is in Rule 605 (formerly 602) which formerly specified that interlocking signals, unless otherwise provided, did not supersede the superiority of trains, but now says without qualification, "Interlocking signals govern the use of the routes of an interlocking plant, and as to movements within home signal limits, their indications supersede the superiority of trains, but do not dispense with the use or the observance of other signals whenever and wherever they may be required." This rule was particularly objected to in the discussion at the meeting of the Association last November. The committee must be presumed to have known how it would work in practice; but it may be hard for the uninitiated to understand how it is to be applied everywhere.

Thus, at a crossing interlocking on a double-track road there may be an interlocked crossover and an interlocked siding switch; the interlocking station may not be a block or train-order station and the signalman may have no direct communication with the dispatcher and no knowledge of the movement of trains other than sufficient notice of their approach to enable him to clear his signals in good time for them. This signalman, possibly an employe of the other road, would presumably throw the switches and give the necessary signals for switching movements, when asked to do so. Apparently, then, under the rule, a train, or an

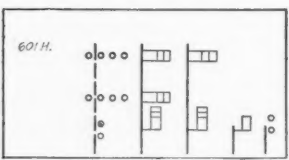
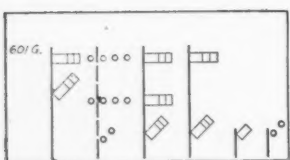
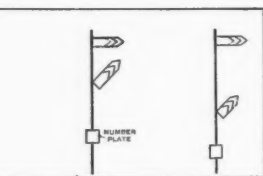
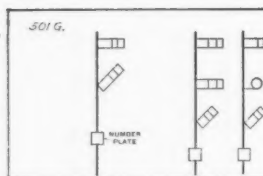
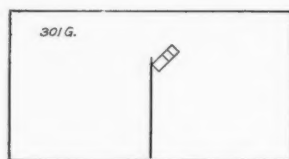
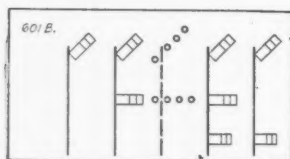
*This is the second of a series of three articles by the Assistant Signal Engineer of the Pennsylvania Railroad. The first article, dealing with the rules pertaining to block signaling, was published March 17, page 471.

engine with part of its train, could cross over, enter the siding and switch back and forth on or across the other main track, on the time of a superior train on that track, so long as it kept within home signal limits—although, in the absence of a definition, there might indeed be some uncertainty as to what the home signal limits were.

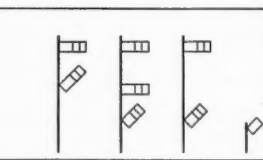
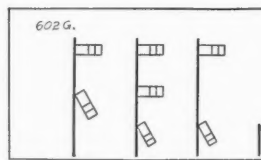
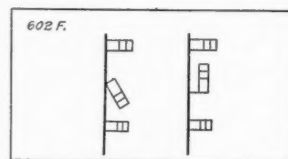
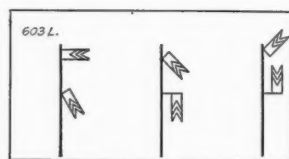
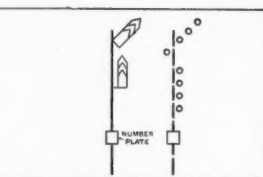
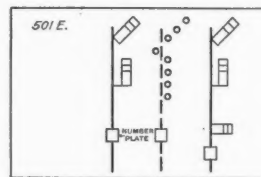
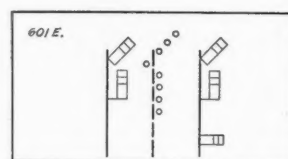
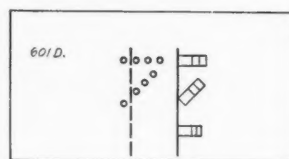
On lines on which trains are run by block signals (Rules D-251, etc.), or on which all of the signalmen are in close touch with the movement of trains and with the despatcher, and are properly instructed, the rule may be very convenient. Proper instruction would seem to be necessary or advisable, as there is nothing in the rules to tell the signalmen what they are to do or what is their responsibility in the matter; although they might deduce from the train and train-order rules that they should pay some attention to superior trains and not permit movements to be made on the time of such trains without authority. At numerous interlockings on lines of a different character, however, application of the rule will probably not be wanted; it would simply transfer from the trainmen to less qualified or informed signalmen, the duty of getting the necessary authority to occupy main tracks on the time of superior trains, when crossover or switching movements were to be made at interlocking plants.

There are various changes in the wording of the rules, such as the substitution of the phrase, "most restrictive in-

dication," for "normal indication," in several rules, and "a signal permitting a train to proceed" for "a clear or caution-signal," in Rule 661 (formerly 662). In Rule 613 (formerly 614) reference to a clear route and the clearing of signals is avoided by the wording, "When the route is set the signals must be operated sufficiently in advance of approaching trains to avoid delay." Rule 615, however, (formerly 616), has not been revised to accord with either Rule 613 or Rule 661: "If necessary to change any route for which the signals have been cleared for an approaching train or engine, switches must not be changed or signals cleared for any conflicting route until the train or engine, for which the signals were first cleared, has stopped." Evidently there is pressing need of a word (such as "open"?) that will express the state of a signal giving any indication other than Stop, without implying that the signal indicates Proceed.



Standard Code Signal Aspects; Rules 601B; 301G; 501G; 601G; 601H



Standard Code Signal Aspects; Rules 601D; 601E; 501E; 603L; 602F; 602G

STANDARD CODE OF SIGNALING RULES, AMERICAN RAILWAY ASSOCIATION: SIGNAL ASPECTS AND INDICATIONS.

The illustrations on this page, taken from pages 9, 52 and 54 of the block signal rules, and pages 10, 12, 14, 16, 20 and 24 of the interlocking rules, are here arranged in the order in which they are referred to in the text. The indications and names are as follows:

- 601 B.—Indication, Approach next signal prepared to stop. Name, Approach-Signal. Requisites of Installation: For semi-automatic signals, "signal will appear when block is clear; second block in advance is not clear"; for non-automatic signals: "route is set; next signal is not clear."
- 301 G.—Indication, Proceed with caution prepared to stop short of train or obstruction. Name, Permissive-Signal. Requisites of installation: "Signal will appear when block is occupied."
- 501 G.—Indication, Proceed at slow speed prepared to stop short of train or obstruction. Name, Permissive-Signal. Requisites of Installation: "Signal will appear when block is occupied or switch is set to diverge."
- 601 G.—Indication, Proceed at slow speed prepared to stop. Name, Slow-Speed Signal. Requisites of Installation: For semi-automatic signals, "signal will appear when route is set; track may or may not be occupied"; for non-automatic signals, "signal will appear when slow-speed route is set; track may or may not be occupied."
- 601 D.—Indication, Proceed at restricted speed prepared to stop at next signal. Name, Restricting-Signal. Requisites of Installation: for semi-automatic signals, "signal will appear when block is clear; second block in advance is not clear"; for non-automatic signals, "signal will appear when restricted speed route is set; next signal is not clear."

- 501 E.—Indication, Approach next signal at restricted speed. Name, Approach-Restricting Signal. Requisites of Installation: "Signal will appear when two blocks clear."
- 601 E.—Indication, Approach next signal at restricted speed. Name, Approach-Restricting Signal. Requisites of Installation: For semi-automatic signals, "Signal will appear when two blocks are clear"; for non-automatic signals, "signal will appear when restricted speed route is set at next signal."
- 603 L.—Indication, Approach next signal at restricted speed. Name, Approach-Restricting-Signal. Requisites of Installation: "Signal will appear when home signal indicates proceed at restricted speed."
- 602 F.—Indication, Proceed at restricted speed. Name, Clear-Restricting-Signal. Requisites of Installation: For semi-automatic signals, "signal will appear when block is clear"; for non-automatic signals, "signal will appear when restricted speed route is set."
- 602 G.—Indication, Proceed at slow speed prepared to stop. Name, Slow-Speed-Signal. Requisites of Installation: For semi-automatic signals: "Signal will appear when route is set; track may or may not be occupied." For non-automatic signals, "signal will appear when slow speed route is set; track may or may not be occupied."
- 601 H.—Indication, Proceed at slow speed. Name, Clear-Slow-Speed-Signal. Requisites of Installation: For semi-automatic signals: "Signal will appear when block is clear"; for non-automatic signals, "signal will appear when slow speed route is set."

Drifting sand is included among the conditions requiring special care in operating switches, Rule 619 (formerly 625). An addition to Rule 622 requires defects in the interlocking plant to be promptly reported. Rules 624 and 684 are amplified to include the disconnection of a derail, detector bar, or its equivalent, or a lock—when “all switches or derails affected must be safely secured.”

In Rule 663 a blank replaces the requirement that engine-men and trainmen, before proceeding on hand signals, must “know that they are protected.” The last sentence, prohibiting trainmen from giving proceed hand signals which conflict with interlocking signals, is omitted.

New Rule 670 reads, “A reverse movement within the limits of an interlocking plant, or a forward movement after making a reverse movement, must not be made without the proper interlocking signal or permission from the signalman.” This is a valuable addition. It will partially guard against the error of starting to move in the middle of a plant, without the knowledge of the signalman, who may have changed some switch or started a conflicting movement. Apparently the rule would have been complete if it had also covered the continuation of a movement without change of direction, after a stop within the limits of an interlocking plant.

Instructions similar to those on Caution Card, Form D, might well be embodied in an additional interlocking rule providing that, before movement past a stop signal is authorized in any prescribed way, the signalman must know that the switches through the interlocking are properly set and locked.

ASPECTS AND INDICATIONS.

The arrangement of the rules giving the signal indications, aspects, etc., is a decided departure from that formerly found in the codes. At first glance the addition of conventional pictures of the aspects seems to be a convenience. When one considers, however, that the aspects are not presented as standards or recommended practice, that they are merely illustrations—“typical,” and that each road is expected to show the aspects and colors of lights it uses, it is difficult to understand what good purpose is served by the bewildering display. It may be surmised, of course, that some of the workers on the rules were determined to gain a foothold in the codes for the most modern aspects, and that the only way to do this was to bring in about all the aspects to be found in the country, so that no road could feel that it was discriminated against or that its practice was, even in appearance, discredited. The practical effect is to advertise, in a way to compel attention, the array of different aspects in use on the various roads of the country. And perhaps there were those who thought this not a bad step in the direction of progress.

With all the wealth of material available, no distinction is suggested between the first (one-arm) aspect in Rule 601 B—indication, “Approach next signal prepared to stop,” and the aspect in Rule 301 G—indication, “Proceed with caution prepared to stop short of train or obstruction.” These indications are quite different in words, presumably for some reason; but the fact that the Association was at no pains to suggest any difference, or the desirability of any difference, between the aspects, raises a question whether there is any real difference between the indications. This question will be considered in another place.

The names of the signals have already been alluded to in connection with Rule 34. It cannot escape notice that two signals having the same name, “Permissive-signal,” have quite different aspects and rather different indications—Rules 301 G and 501 G. On the other hand, some of the aspects in Rules 501 G and 601 G are very much alike and it would seem that the indications would require about the

same action although they differ in wording; nevertheless, the names of the signals—“Permissive-signal” and “Slow-speed-signal”—are decidedly different.

In the old rules the “occasion for use” of each indication was given: as, “Block is not clear,” “Route is clear,” etc. It has long been obvious these statements were of little practical value and that, in any event, they should not have been published to the enginemen, because the only thing that an engineman is concerned with is what the signal indication tells him, or permits him, to *do*. Happily it is now recommended that the corresponding matter be omitted from the revised rules issued to enginemen and trainmen. The revised matter of this character, however, purports to be “Requisites of installation.” Now, a manual-block signal, Rule 301, is quite commonly free to be moved to any position at the will of the signalman. Just how it comes to be a requisite of *installation* that such a signal should be at stop when the “block is not clear,” at proceed when the “block is clear” and should take the position of a “permissive” signal when the “block is occupied,” is, therefore, a mystery.

In the case of matters with which the proper installation of interlocking or electrical control has something to do, it appears that, if a signal is semi-automatic, the “restricting-signal” (Rule 601 D) will appear when “block is clear; second block in advance is not clear.” It apparently makes no difference what route is set. So, too, if a signal is non-automatic, the “approach-restricting-signal” (Rule 601 E) will appear when the “restricted speed route is set at next signal”; apparently it makes no difference what route is set at the “approach-restricting” signal, or what the next signal indicates (possibly stop), or the signal a few hundred feet beyond that. But if the signal is semi-automatic, routes (and next signals) seem to have nothing to do with it; the signal will appear when “two blocks are clear.”

However, it is useless to go further. The only redeeming feature of these absurd and futile so-called requisites of installation is the note at the tops of the columns, “Not to be printed in the Rules for Enginemen and Trainmen,” which would have disarmed criticism if it had read, “Not to be printed anywhere.”

CHANGES IN INDICATIONS

Only two of the old signal indications remain entirely unchanged—“Stop” and “Proceed.” Several of the new indications serve to remove an obvious defect in the former codes; that is, the failure to provide all of the indications to be given by two-arm and three-arm signals which had been in common use for years. These new indications introduce what has been known for several years as “speed signaling.” The term had been used frequently in the discussions of the Railway Signal Association and the American Railway Engineering Association, and of their committees, and similar indications, differently worded, were adopted by those associations in 1913. The difference in wording, however, is fundamental.

The first change to be noted is the provision of two stop indications. The indication of an automatic block signal that may be passed, at stop, in accordance with Rule 509 is “stop; then proceed” (Rule 501 AA). A new indication is, perhaps, proper enough, although it had previously been thought sufficient to designate by some distinctive mark the signals that could be so passed. Taken by itself, however, this new indication does not seem to say what it means. It is evidently not intended that a train, after stopping, shall *proceed* as it might after passing a clear signal. For this indication, then, all of the qualifications must be looked for in another rule (509). In the case of the “permissive” signals, Rules 301 G, 401 G and 501 G, the contrary course was followed; the detailed instructions were put into the

indications. The automatic-signal indication could better have been, Stop; then proceed with caution.

SPEED INDICATIONS

The five speed indications relate to two speeds called "restricted speed" and "slow speed." In the schemes of signaling adopted in 1913 by the Railway Signal Association and the American Railway Engineering Association, the terms used are "medium speed" and "low speed." It is obvious, of course, that none of these indications specifies any definite rate of speed; a road using any of them must prescribe in its rules or instructions the speed to which trains are limited by each speed indication. But it is equally obvious that the only justification for two groups of speed indications is the convenience of signaling for a speed intermediate between the highest permissible speed at a given location and the lowest speed indicated by operating fixed signals. The term "restricted speed" suggests no such intermediate relation. Restricted speed may be any rate lower than the maximum permitted; "slow" speed itself is a restricted speed. It is clear, then, that "medium speed" is the much more appropriate term. The reason for the change, however, may be the expectation that, on some roads or portions of roads, restricted speed will not be an intermediate rate but will be made the same as slow speed. By this expedient the second speed indication, "Approach next signal at restricted speed," and its aspects, would, of course, be made available for bringing a train down to low speed at a home signal governing over a low-speed route. By fixing one speed for all of the speed indications, however, a road would be in the position of using two indications and aspects to mean the same thing, and of installing an elaborate signal system to very little purpose. To meet the condition, if that is what is in view, the elaborate system might better have been made still more elaborate as a whole, but possibly simpler in some applications, by the addition of another indication, "Approach next signal at slow speed."

As for "slow speed" and "low speed": through some unaccountable perversity in choice of language the Association has adopted precisely the wrong word—with the right one ready to hand in the earlier schemes. "Slow" is the opposite of "fast"; and no careful speaker ever says "fast speed." We constantly speak of "high speed"; and "low" is the opposite of "high." There may be in the language some far-sought precedent for the use of the phrase "slow speed." But this phrase is out of place on a railroad, where a *fast train* runs at *high speed* and a *slow train* runs at *low speed*.

The first speed indication, Rule 601 D, is "Proceed at restricted speed prepared to stop at next signal." Taken literally, this may, in certain cases, indicate two courses of action that are not consistent. The indication will naturally be given for movement over a restricted-speed route when the next signal is at stop, because, if that signal clears before the arrival of the train at the first signal, the aspect can be changed to that indicating "Proceed at restricted speed," by the mere movement of the second arm from the diagonal to the vertical position. Now, if restricted speed should be forty miles an hour, requiring, say, 1,300 feet for a service stop, and the next signal should be only 600 feet ahead, the train evidently could not proceed at the prescribed restricted speed and at the same time be prepared to stop at next signal.

In the earlier schemes this inconsistency was avoided in the corresponding indication "Proceed with caution on medium-speed route." In this indication it is made clear that the speed is limited to medium speed, in that the train is to proceed on a medium-speed route, but the language does not suggest that the signal may be passed at medium speed, as do the first words of the code indication. The words "Proceed with caution" imply not only preparation to stop at

the next signal, whether it be near or far, but preparation to stop for any other reason, as after entering an occupied manual block by way of a medium-speed route. It will be noticed that the new rules do not provide an indication for the latter condition, corresponding with the manual-block, "permissive" indication, Rule 301 G.

With either wording, of course, when the next signal is too close for a service stop from the prescribed medium or restricted speed, the train receives, at a signal in the rear, some indication that brings it down to less than medium speed. The code indication is simply less consistent than the other in that it seems to say that the train may proceed at restricted speed.

The second speed indication, "Approach next signal at restricted speed," is open to objection of an opposite character. It is occasionally necessary to install a series of signals at such spacing that there is not sufficient distance for the fastest trains to get down to medium speed between one signal and the next, and to give the indication in question at one of these signals when medium speed is required, not at the next signal, but at the one beyond that, or even farther along. Under such circumstances the indication does not say what it means; it calls for action that is not required or desired. The corresponding indication in the earlier schemes is "Reduce to medium speed." This exactly fits the case; for it presupposes at least sufficient distance for the reduction from the highest speed permitted where the signal is located, regardless of the point at which the next signal may be.

The third speed indication, "Proceed at restricted speed," is free from the defects of the first two. Presumably it is to be given when conditions affecting the signals are such that restricted speed may be maintained. In the most elaborate of the three earlier schemes, the similar indication is "Proceed on medium-speed route"—corresponding with, and paving the way for, the more limiting indication, "Proceed with caution on medium-speed route." It may be said here that the reference to routes in these, and in the low-speed indications of the earlier schemes as well, is quite in accord with the fact that speed signaling was developed as a substitute for route signaling and the fact that almost always, if not in every case, the speed indications, except the second, are given in connection with the different routes at points where two or more tracks are connected.

The fourth speed indication, "Proceed at slow speed prepared to stop," is not an improvement on the earlier one, "Proceed with caution on low-speed route." Movement with caution is what is called for and the indication might better say so. The last, "Proceed at slow speed," corresponds in form with the third and is of the same effect as its predecessor, "Proceed on low-speed route."

In a third article the general subject of caution indications will be taken up in more detail.

RUSSIAN RAILWAY FINANCE.—By the beginning of September, 1915, without reckoning roads constructed in the region occupied by the field army, work had already begun on the construction of a network of Russian State railways with a length of 3,530 miles, to cost \$315,368,000. The construction has been sanctioned of new lines totalling 300 miles at a cost of \$26,478,000, and the building was proposed of new railways totalling 1,812 miles, at an outlay of \$196,194,000. In all, these new lines and branches have a length of 5,645 miles, and for their construction is demanded about \$538,000,000. The realization, however, of proposals for the building of new lines has been postponed till the end of the war. Moreover, in 1915 permission was granted for the construction of 848 miles of private railways, representing a cost of \$5,454,000. Finally, there are projects for new lines approved by the commission on new railways, but which as yet have not received ratification.

B. H. MEYER

In conformity with the practice of the Interstate Commerce Commission adopted a few years ago, Balthasar H. Meyer has been appointed chairman of the commission, succeeding Charles C. McChord. Mr. Meyer was appointed a member of the Interstate Commerce Commission by President Taft in January, 1911. Previous to his appointment to the commission he had gained a high reputation as an economist and had had five years of practical experience in the regulation of railroads as a member of the Railroad Commission of Wisconsin. Mr. Meyer had been a professor of political economy in the University of Wisconsin since 1900. He has brought, therefore, to his work on the Interstate Commerce Commission a broader knowledge of some of the aspects of the commission's work than any other member of the commission. With this broad knowledge has been combined a conscientious desire to be scrupulously fair and a capacity and willingness for hard work.

Mr. Meyer was a member of the Hadley Securities Commission, which was appointed by President Taft to investigate the question of the issuance of railroad securities. The knowledge gained in this investigation has unquestionably been of great advantage to Mr. Meyer in his work as Interstate Commerce Commissioner. Commissioner Meyer was in the majority which refused to permit the railroads to raise their rates in the 5 per cent rate advance case of 1913, and again in the majority which permitted this rate advance, with certain exceptions, in 1914. A cataloguing of the cases handled by Commissioner Meyer would probably show a substantial majority of these cases decided against the railroad companies. This in part is due to the character of the cases which were assigned to him. Probably no one of the railroad men who have dealt directly with Commissioner Meyer have

anything but a great respect for his desire to be entirely just. It may be at times that he has allowed his intimate personal knowledge of conditions in Wisconsin to influence his judgment in regard to general conditions, and this was pretty surely the case in his work on the Securities Commission; but in general he has a mind open to conviction and unhampered by earlier political prejudices or ambitions.

Commissioner Meyer has been in charge of that department of the commission's work which deals with accounting and the annual reports of railroad companies to the commission and he has worked consistently to harmonize, insofar as is possible, the views which he and the commission's statistician, W. J. Meyers, hold and the views of the Association of American Railway Accounting Officers. Commissioner Meyer's object has been to have a system of accounts formulated which would serve as a cost accounting system,

and at times his theories have been in conflict with what practice has demonstrated to be the most useful system of accounts for the control of expenses by the management. If the powers of the Interstate Commerce Commission are to be enlarged the presence of such a man as Chairman Meyer on the commission is a cause for confidence to all who have the best interests of successful railway regulation at heart.

Balthasar Henry Meyer was born in Mequon, Ozaukee county, Wis., on May 28, 1866. He taught district school in the winters of 1884-86 and became principal of the schools in Fredonia, Wis., in 1887. In 1889 he was made principal of the high school in Port Washington, Wis. He graduated from Oshkosh normal school in 1893 and received the degree of B. L. from the University of Wisconsin in 1893, and of Ph. D. in 1897. He attended graduate courses at the University of Berlin during 1894-95. In 1896 he was appointed extension lecturer for the University of Wisconsin, and was made assistant professor of sociology in 1899. He was elected professor of political economy in 1900 and was granted leave of absence from the university in 1905 to become a member of the Railroad Commission of Wisconsin. He was chairman of the commission from 1907 to 1911, when he was appointed to the Interstate Commerce Commission. He is the author of "Railway Regulation in the United States," published in 1903, and has written a number of articles on economic subjects.



B. H. Meyer

RAILROADS PRESENT COUNTER-PROPOSALS

On March 30, the day on which the brotherhoods of railroad train service employees presented their demands on the railroads of the United States, providing for the "basic eight-hour day" and time and one-half for overtime, the individual railroads replied with letters serving notice of their intention to open for consideration all provisions of the

schedules affected by the demands.

The executive committee of the Association of Western Railways issued the following statement explaining the position of the railways:

"The demands of the employees contemplate revolutionary changes in certain provisions of the existing wage schedules, but they would effect only a one-sided revolution, resulting in an increase in the wages of these employees amounting to \$100,000,000 a year. The reply of the railways gives notice that all parts of the provisions in the schedules governing compensation in the classes of service affected by the proposals of the employees will be opened up for consideration and disposition. This notice simply means that the railroads open up for consideration not only those parts of the provisions affected by the proposals of the employees, but all other parts of these particular provisions. There are

parts of them with which the railways are and have been dissatisfied, and which have been forced upon individual roads or groups of roads by threats of strikes or by arbitration awards. The railways, while dissatisfied with the features in question heretofore have left them undisturbed, but in view of the demands of the employees the managements believe that these matters should be given a thorough reconsideration.

"The reply of the railways also provides for consideration and disposition of any provisions of the schedules applying to train service employees which are in conflict with certain specified principles. These principles are:

"(a) No double compensation for the same time or service.' (There are cases where train service employees are paid double for the same time or service. The railways want to abolish this practice.)

"(b) The same classification for the purpose of compensation to be applied to all members of a train and engine crew.' (Often part of the members of a crew insist on being classified in one kind of service, as yard service, and other members insist on being classified in another kind of service, as in road service, in order that each part of the crew may get the highest possible rate of pay.)

"(c) Two or more differently paid classes of service performed in the same day or trip to be paid proportionate rates according to the classes of service, with not less than a minimum day for the combined service.' (This is intended to destroy the arrangement under which in many cases employees work a part of a day in one class of service, as work train service, and another part of a day in another service, as through freight service, and get two or more full day's pay, although both classes of work together may take less than a day.)

"The letters presented by the employees to the individual lines request that they 'join with other railway managements in the United States and enter into a collective movement for the purpose of handling this proposition at one and the same time through a joint committee representing all railroads concerned.' They state that the committees of the brotherhoods 'are instructed to advise you that the organizations stand ready to do likewise.'

"The concerted action by train service employees on all the railways and the request by them for concerted action by the managements of all the railways are unprecedented in the history of this country. What action on this request the railways will take is as yet to be determined. A reply to it on or before April 29 is requested. Many of the railways are very reluctant to join in a general movement contemplating the establishment of schedules applying on all roads entirely regardless of differences in their traffic, in their physical and operating conditions and in the general conditions in the various parts of the country. Many railway managers also seriously question whether consistently with their duty to their stockholders and to the public, they can acquiesce in a general movement on the part of all the train service employees which puts in the hands of these 300,000 employees the power to tie up simultaneously all the railways of the United States."

The eastern roads also issued a similar statement.

Commenting on the demands submitted by the train service employees, J. W. Higgins, executive secretary of the Association of Western Railways, made a statement, saying in part:

"Speaking purely as an individual, I may say that in my judgment the present situation is one of the gravest which has ever confronted the railroad managers of the nation. To comply with the demands which the trainmen make would mean an added cost of operation of something like \$100,000,000 per annum; and this shock coming at a time when one-sixth of the railroad mileage of the country is in the

hands of receivers would be more than the carriers could stand. You can get a pretty good idea of what the demands mean when I tell you that to grant them would be to sweep away at one stroke more than twice as much money as the railroads have derived or will derive from the increases in rates granted by the Interstate Commerce Commission during the last year and a half.

"It is true that there has been an appreciable increase in railroad revenues during the last six or eight months, but, as James J. Hill so aptly declared in New York the other day, these increases are largely, if not altogether, due to the large export business. They do not represent a wholesome or dependable domestic activity, and once the European war comes to an end, there is every reason to believe that there will be an enormous falling off in railroad incomes. Furthermore, even with the recent increase in earnings, the percentage of net return on property investment earned in the last 6 months of 1915 was less than in 1912.

"Have the railroad officials of the country the right to grant such a request and assume such a tremendous new burden of increased cost of operation at the simple command of some 300,000 men who are already the best paid employees in the field of American labor, and who represent less than one-fifth of the vast army of a million and three-quarters of people employed by the carriers? Is not the great American public, which in the end must foot the bill, entitled to some consideration? The railroads have no way of getting money except as the people pay it to them for service. If they agree to this new burden and add one hundred million dollars more to their yearly cost of operation, have they any other resource open except to ask the Interstate Commerce Commission to give a new increase in revenues sufficient to cover it?

"As I stated above, the trainmen who are back of the present demands constitute less than one-fifth of the employees of American railroads, and they are already the best paid workmen in the nation. It, therefore, occurs to me that they should not at this critical time in our country's history precipitate a controversy which gravely menaces the industrial well-being of the nation. We are just emerging from one of the worst business depressions in our history—and we may at any moment be compelled to meet the setback which will come at the conclusion of the European war.

"Furthermore, the railroads have given and are constantly giving a 'square deal' to their employees. As evidence of this fact, within the past few weeks a large number of roads have granted voluntary advances to many of their employees who, in the judgment of the managements, were entitled to it. But there are a great many more who have not yet been taken care of. And this is one trouble with the present demands of the trainmen, who, by means of their organizations, have in times past forced the carriers to give them more than their just share of increased remuneration. Once revenues permit it, there are a million and a half other employees on the pay-rolls of the railroads who are entitled to first consideration.

"The fact that the railroad brotherhoods have refused to deal with the individual lines and systems but are directing their demands to the carriers as a whole, shows that the railroad problem is becoming more and more national in its scope and character, rather than local—a goal toward which the employees and other influences are driving it, despite the feelings or preferences of the different railroad managements. Acting in this way, these men undoubtedly have the power to tie up every railroad in the United States should they conclude to exercise it. What action the managements of the railroads will take in meeting the demands of the engine-men's and trainmen's organizations, I cannot say. The matter is now in the hands of the various railroad executives and it is not within my province to speak for them."

Full Investigation of Amherst Accident

Testimony Shows Three Trains on New York Central
Were Wrecked in Spite of Good Equipment and Discipline

The accident on the New York Central Lines West, near Amherst, Ohio, at about 3:18 a. m., on March 29, in which two eastbound passenger trains met in a rear end collision, and a westbound passenger train on the adjacent track ran into the wreckage, as mentioned in the news columns of the *Railway Age Gazette* of March 31, was made the subject of a searching investigation jointly by the Interstate Commerce Commission and the Public Utilities Commission of Ohio, in Cleveland on March 31 and April 1. The taking of testimony by H. W. Belnap, chief of the division of safety of the I. C. C., was completed on the latter date, but the commissions are conducting tests on the signal apparatus in the vicinity of Amherst in an endeavor to secure any information that may throw further light upon the causes of the accident. These tests may require a considerable time for completion.

The two eastbound trains were the first and second sections of No. 86, known as the Chicago-Pittsburgh-Baltimore Limited which left Toledo, 81 miles from the point of the accident, at 1:43 a. m., and 1:56 a. m., respectively. Train No. 25, the Twentieth Century Limited, westbound, left Cleveland, 32 miles east of Amherst at 2:34 a. m. As all of these trains were a little behind time, they were being run at a rate somewhat faster than scheduled time, but well within the speed limit of 70 miles per hour. A dense fog existed at Amherst at the time of the accident and extended 15 or 20 miles west. This did not interfere, however, with the operation of the first section of No. 86, whose engineer received a caution indication at the distant signal west of the Amherst interlocking plant. He slowed down and made a stop about 200 ft. west of the home signal and whistled for the signal, which then cleared. Before his train had moved as far as the home signal, it was struck at the rear by train second No. 86, whose engineer was certain he had received a clear signal at the next location west of the point of the accident. The collision derailed the two rear cars of the first section, a coach and a club car, throwing them to the north across the westbound high-speed track where they were run into in less than a minute later by the Twentieth Century Limited. About forty passengers were riding in the coach and two men, a Pullman porter and a New York Central employee off duty, were in the club car. These two employees and 25 of the passengers were killed, 18 others receiving injuries serious enough to require their removal to a hospital. So far as is known, no one was seriously injured except those mentioned in the last two cars of first No. 86.

It proved to be a very difficult matter to fix the blame for the accident on any employee or officer of the company. The operator in the Amherst tower, Albert H. Ernst, testified that when his buzzer rang upon the entrance of the first section of No. 86 into the annunciator circuit, about 1½ miles west of the tower, he looked at his track indicator, which showed the section of track 2, on which the train was approaching, to be clear ahead of the home signal so that he could clear that signal for a continuous movement. He accordingly pulled lever 40 in the mechanical interlocking machine which controls the clearing circuit for the semi-automatic power-operated home signal for that track. This should have cleared the signal, and Ernst testified that the indicator in the tower went to the clear position, showing that the signal had properly operated. His attention was first called to the failure of this signal to give the clear indication by the whistling of first No. 86. He then glanced at the signal indicator and found it at stop, whereupon he threw

the lever back to normal and reversed it again, clearing the signal properly. The testimony of representatives of the signal department conflicted with that of Mr. Ernst, however, in that the circuit for the stick indicator would prevent it from returning to danger after it had shown clear until the train occupying the section had passed out of the limits of the plant or the towerman had operated a hand release. In any event, first section of No. 86 should have been fully protected by automatic signals in the rear.

Flagman Beach on train first No. 86 testified that when he felt the brakes being applied on passing the distant signal, he immediately stepped out on the back platform and dropped a five-minute fusee. As soon as the train stopped, he started back to protect the rear end, but was recalled by whistle. When the engineer attempted to start his train upon the flagman's signal it stalled and he had to back up to take the slack. Flagman Beach immediately got down on the ground again to go out if necessary and he then heard second No. 86 approaching. He ran back as fast as he could, and flagged the approaching train with a fusee and his red and white lantern. The distance between the trains at that time, however, was so short that the application of the emergency brakes and the collision came almost at the same instant. It is estimated that 4 to 5 minutes was consumed from the first stop to the time of the collision.

Engineman Hess on second No. 86 testified that he had been running at least two blocks behind the first section after leaving Toledo, and had read every signal he passed. He was positive that the distant signal had been clear and he had seen no fusee except the one held by the flagman. His train was running about 50 miles an hour when the collision occurred, this being the limit of speed through interlocking plants. His fireman told the investigating board that he had been busy with other duties immediately before reaching the distant signal, and had not seen four or five of the signals, although engineer Hess had called them all white as they passed. The flagman of second No. 86 went back immediately after the accident in company with the brakeman of No. 25, and together they observed that the distant signal and the automatic signal controlling that block were both in the stop position.

Towerman Ernst had only been stationed at the Amherst plant for five days at the time of the accident, but he had been in charge of similar plants at other points for some time and was experienced and thoroughly competent. His work had always been entirely satisfactory. The three engineers involved all have good records behind them. E. W. Leonard, engineer of train first No. 86, had been driving engines on that division since 1888, W. H. Hess, engineer of second No. 86, since 1899, and C. C. Robertson, engineer of train No. 25, for about thirty-five years. The flagman had thirteen years' experience, and some of the other trainmen were even older in the service. With the exception of Hess, no one of the men involved had ever been in a serious accident before, and his record was by no means a bad one. He had been disciplined in every instance where he had failed to live up strictly to the rules and in common with all of the other passenger engineers on that division, had been cautioned particularly to exercise care in reading signals, only a few months before by the road foreman of engines.

The hearing also brought out a considerable amount of testimony bearing on the operating methods, signal performance, and the discipline of employees. It was shown that it is customary to run the two sections of a train about a

telegraph office apart, this distance averaging about seven miles. While it is not customary to make up time in foggy weather, these adverse weather conditions are not allowed to interfere with making speed as long as the engineers can be sure of reading their signals. It was clearly brought out that in the last analysis the speed at which it is safe to run under any given conditions must be left largely to the judgment of the engineman who is obviously in the best position to judge. A. S. Ingalls, general superintendent, told of the checks that have been made on enginemen to determine whether they are exceeding the specified speed limit, and whether they are running on caution signals. Other officers told of the almost daily inspection which is provided by the operating officers riding over the division. Mr. Ingalls testified that the instructions in regard to the efficiency or surprise tests require the trainmasters to conduct them as often as possible, preferably at least once in sixty days. They are forbidden to introduce any abnormal conditions or to endanger life in any way. All of the enginemen involved had been subjected to surprise tests within recent months and had been reported perfect. A considerable discussion was raised as to the comparative merits of the flagging rule on the lines west, which provides that a flagman shall return to his train when whistled in providing he can not see or hear a following train, and that in use on the lines east, which is practically the same as rule 99, in the standard code, that a flagman when he starts back shall continue to a sufficient distance to protect his train and be picked up by a following train. The difficulties of applying this rule literally, on account of the large number of flagmen that would be required on each train, or of applying it with liberal allowance for judgment on the part of the men, on account of the obvious dangers resulting from such an allowance, were made clear.

While the stopping of train first No. 86 was not a factor in creating a dangerous condition, considerable testimony was taken as to the operation of this interlocking plant. The towermen and operators testified that trouble had been reported rather frequently and the maintainer stated that signal 40 had been reported out of order about ten times in the 2½ years since the plant was installed. In most cases, however, these troubles had been located and remedied by the maintainer. F. B. Wiegand, signal engineer, outlined the system of inspection in use under which automatic signals are inspected at least once a year and interlocking plants at least twice a year, the second inspection in the latter case being made about three months after the first in order to check up items reported the first time. This testimony showed that the eastbound home signals at the Amherst plant are about 1,210 ft. from the tower, and are located on a bracket pole with two dolls south of the track. The distance from the home to the distance signal is about 5,400 ft., and from the distant to the next automatic signal about 7,689 ft. The track is straight for a considerable distance west of this point and the grade is 0.3 per cent rising eastbound.

Mr. Wiegand testified that on the Toledo division with approximately 795 signals, counting each arm as a separate signal, and three-position signals as two, there have been 13,501,435 movements during the years 1914 and 1915 with a total of 1,160 failures, or one for every 11,639 movements, and only 9 clear failures, an average of 1,500,159 movements per clear failure. He detailed the reasons found for these clear failures and the remedies applied, from which the following is abstracted:

On July 15, 1914, signal S 40.1 remained clear with a switch in the block set for a siding, on account of a construction man having made a wrong connection in the circuit controller. On September 14, 1914, distant signal S 45.2, remained clear with a train order signal at stop, on account of the control wire being grounded on a guy wire, the insulation having been worn through. Instructions were issued to signal and telegraph men to keep guy wires away from line wires. On December 1, 1914, distant signal S 45.1, remained clear with a train in the block on account of the counter being caught on the slot arm. Counters were immediately inspected on all signals, and where necessary the conditions were corrected to prevent a recurrence.

On February 9, 1915, signal 192.2, indicated clear with a train in the block on account of rain seeping in where the doll pole had been leaded into the bearing casting, the water freezing the armature. When a new mast was installed, the joint was recalked and painted, and all supervisors were advised to examine signals for similar conditions and correct them if found. On September 12, 1915, signal S 133.2, remained clear behind a train, a jumper wire having been broken by a dragging freight beam allowing foreign current to hold up the relay. A center-fed track circuit was installed to prevent recurrence. On December 21, 1915, distant signal S 10.1 remained clear with the home signal at stop, two control wires having been grounded in an underground cable. This accident was caused by mice having chewed the insulation. Insulation tests were made with a megger on all cables following this occurrence. On December 4, 1915, signal S 61.4 remained at clear falsely on account of water getting into the cap over the shaft and freezing. All caps were gone over and holes drilled in the under side or a portion of the gasket removed to prevent a recurrence. It was found that the trouble in this case had been caused by painters standing on the caps and this matter was taken up with the master painter to correct in the future. On January 18, 1916, signal S 14.2 indicated clear with a train in the block on account of a nut having bridged the contacts on the back of a lightning arrester. This resulted from carelessness on the part of a construction man and the supervisors were instructed to call their men's attention to this fact, and see that they located all metal parts dropped around mechanisms or machines. The nut in this case was held in this position by a cobweb. This type of arrester is being replaced as fast as possible. On January 28, 1916, signal S 12.8 remained clear behind a train on account of the relay armature freezing in the pick-up position, moisture having been produced by the relay sweating. This relay was sent to the signal company for tests, and ventilators were recommended. They are being installed on all non-ventilated relays as fast as possible.

The flagman of second No. 86 and the head-brakeman of No. 25 went together to the distant signal immediately after the accident, and the flagman remained there until the arrival of L. L. Whitcomb, supervisor of signals, shortly after day-break. The flagman testified that no one touched the signals while he was there and Mr. Whitcomb and other representatives of the signal department who came later, testified that no repairs whatever were made to any part of the signal system with the exception of the replacing of the bond-wires. All of the mechanisms, relays, circuits, etc., were found to be in normal condition and the system operated properly when the tracks were repaired. A test was made for foreign current which showed a fluctuating current, varying from zero to 40 mil-amperes with both rails broken. It is probable, however, that this current was obtained from leakage from the adjacent track circuits, as the nearest electric line is 1¼ miles away and the electric tracks are between the steam tracks and the power house. No trouble had ever been experienced at this point before with foreign currents.

W. H. Elliot, signal engineer of the New York Central Lines East, was questioned as to the feasibility of applying an automatic train control to prevent such an accident. Mr. Elliot testified that a satisfactory train control device would have prevented the collision, but that he knew of no practical device that would provide sufficient additional advantages to counter-balance the disadvantages that would be created by its use. While in his opinion it is not essential to require a closed circuit between the apparatus on the roadway and on the locomotive in an automatic stop system and some of the other minor requirements which have been held up could be eliminated, he does consider it essential to have a device which, when once applied cannot be released until a train has been brought to a full stop, and which will not operate as long as the engineman is so controlling his train as to be able to stop short of the point of danger. In reference to the use of white lights, he stated that green is much safer for clear than white, and mentioned the fact that instructions have already been issued on the lines west to change this standard.

It is difficult to draw any conclusion as to the showing made by steel equipment in this accident, since the conditions to which the two rear cars of train first No. 86 were subjected, were so severe as practically to defy resistance. The first section of No. 86 consisted of ten cars; one all-wood express, one all-steel mail, six all-steel Pullmans, one steel-under-frame club car, and one all-steel coach. Train second No. 86 consisted of thirteen cars; two all-steel Pullmans, four

wooden coaches, one steel underframe express refrigerator, one wooden baggage, one steel underframe baggage, and four all-steel Pullmans. Train No. 25, consisted of eight all-steel Pullman cars. As near as can be determined, the engine of train second No. 86 ran into the all-steel coach of the train ahead for about 10 ft. The club car was tipped by the impact and thrown at right angles to the adjacent track. It seems apparent that little damage was done to the steel coach by the first collision, except to the seats in the rear, and minor damage to the front corner by sliding on the forward car. The Twentieth Century practically split the club car in the middle carrying one-half of the car body between the locomotive and the superstructure of the steel coach. This practically demolished the superstructure of this steel car, although the underframe was left almost intact.

REPORT OF HOUSE COMMITTEE ON NEWLANDS RESOLUTION

As briefly noted in our issue of March 17, the House committee on interstate and foreign commerce on March 14 reported to the House with certain amendments the Newlands resolution providing for a congressional investigation of the subject of railroad regulation. In submitting its report the committee said, in part:

"While there appeared to be a disposition in the two houses of Congress to honor the suggestion of the President, it was not deemed wise to create an outside commission but a joint subcommittee of the committees of the two houses of Congress clothed with jurisdiction of the subject of transportation; therefore the joint resolution herewith reported to the House was introduced and passed by the Senate.

"Many questions are suggested as demanding investigation and solution and are urged as reasons in support of the joint resolution. It is claimed that the transportation of the country is congested and retarded, greatly to the detriment of commerce, for the want of adequate facilities. Thousands of freight cars loaded with the products of our country—factory, field, and mine—are occupying many miles of terminals and sidetracks in our principal cities vainly awaiting unloading, storage, or forwarding. If this state of stagnation and congestion is not promptly relieved, depression will grow worse, and the business of agriculture, manufacture, mining, and merchandising will languish and be seriously demoralized, to the consequent suffering and loss generally among our people.

"On the 6th and 7th instants the Interstate Commerce Commission held hearings, at which the leading shippers, forwarders, and transportation managers of the country appeared. The purpose was to seek some plan of relief for the present distressing congestion. As no solution was reached by agreement of the various interests, the Interstate Commerce Commission is still considering this important matter.

"It is announced by experts who claim to know that it will require an expenditure of from \$5,000,000,000 to \$15,000,000,000 to supply the railroads of the country with sidetracks, warehouses, terminal facilities, and the other equipments and improvements necessary to handle the transportation business of the country, present and prospective, in the near future.

"In addition to that, when normal conditions are restored following the present universal war and its disastrous effects on our people the tremendous increase of the industries and business of our country will more and more burden railroads inadequately equipped and demand increased facilities. As the railroads must expend a vast outlay of money to handle business before they can expect to derive revenue therefrom, the question of financing these necessary and vast improvements becomes a momentous one, and that is one of the questions which the railroads desire to present for consideration and solution by this subcommittee if raised by this joint resolution.

"Members of the Interstate Commerce Commission appeared before your committee and advised us as to the tremendous increase in the volume, importance, and diversity of its business as well as the difficulties of transacting and disposing of same in a satisfactory manner, suggesting several changes in the law affecting their organization and procedure. Since the approval of the act to regulate commerce in 1887 the system has had a gradual and irregular growth by various and sometimes sporadic amendments, some of them making decided if not radical changes in the original plans and policies and some of them adding new and important activities. So that the entire law to regulate commerce now in force is not a uniform, compact, symmetrical structure, easily understood, but is an incoherent growth, sometimes inconsistent, in some parts hardly reconcilable, and, to say the least of it, the diversities and incongruities should be carefully considered and wherever possible unified and improved, to the end that the federal regulation of carriers may be successfully carried on with the best possible service to the public.

"The improvement of the telephone and telegraph, both wired and wireless, and the operations of the express companies and the connection of our local transportation system with foreign traffic all having grown up or undergone changes in recent times are worthy of study and demand in the interests of the public service thorough consideration.

"The various subjects mentioned for consideration by the joint committee proposed if thoroughly investigated will be better understood by the public, and the investigation will therefore in all probability enable Congress, with the approval of the people, to settle these questions to the best interests of the public. The subject of transportation is vital to the interests of our whole people, and the fact that our government has undertaken federal regulation of interstate and foreign commerce with such a marked degree of success inspires us with faith that the defects in the system can be corrected and the system very largely improved, and to that end there can not be too much light secured and thrown upon the questions involved. Your committee is satisfied, as suggested by the President, that no backward step is contemplated, and so far as this committee or any members of it may be connected with any such investigation no such backward step shall be recommended, but it is the earnest hope of every member of your committee that the investigation, if ordered, shall be directed to the detection of defects in the system, the establishment of truth as to the best way to remedy these defects, and the perfection of the system for the increased convenience and prosperity of the people in every way that human legislative wisdom can accomplish perfection in anything.

"If amended as suggested, your committee recommends that Senate joint resolution No. 60 do pass."

MILK TRAFFIC ON FRENCH RAILWAYS.—The normal daily consumption of milk in Paris and its suburbs exceeds 1,000,000 quarts. Owing to the nature of the territory which it serves the State Railways handle a larger volume of this traffic than any other. In 1913 the State Railways carried 37.1 per cent. of the total, while for the first 10 months of 1915 the proportion had risen to 45.26 per cent. This one railway owns 277 special milk cars, of which 121 are not normally required, but are maintained as a reserve. The Orleans Railway traverses a district which for the first 60 miles outside Paris is lacking in suitable pasture land. Hence this company, which handles about a fifth of the total Parisian supply, has been obliged to develop a long-distance traffic. How it has succeeded in that direction is shown by the fact that while in 1897 the farthest point from which it delivered milk to the capital was 65 miles away, that distance had risen to 96 miles by 1909 and to 180 miles last year. At present Paris is not obtaining its normal milk supply.

Disastrous Floods in Southern California

A Description of the Heavy Damage Inflicted Late in January and the Methods of Reconstruction Followed

On January 16 to 18 Southern California was visited by one of the most severe storms in its history, and on January 26 and 27 it was again visited by a storm of almost equal severity. The average annual rainfall in the vicinity of Los Angeles is about 15 in. and at San Diego about 10 in. Previous to 1914 these averages had not been exceeded for a number of years, but in February of that year the district between Los Angeles and San Bernardino was deluged with from 12 to 20 in. of rain in one month. This interfered seriously with the operation of all the railways in that vicinity and took out many bridges, but the area covered was confined to that skirting the foot of the San Bernardino mountains.

The storms of this year extended over all of Southern California and completely demoralized railway operation on practically all of the lines. As much as 7 in. of rain fell at many points in the two days covered by the first storm and almost as much in the second storm. Because of their large mileage in this area the Southern Pacific and the Atchison, Topeka & Santa Fe were the principal sufferers. The experiences of the Santa Fe in combating these floods and in returning its line to operation were largely common with those of the other roads in this vicinity.

The Santa Fe has two lines from San Bernardino to Los Angeles. The line through Pasadena follows the mountains, lying from one to five miles from the base of the hills. Because of this close proximity to the mountains it must pass the storm waters quickly. Trouble is always expected along this line following heavy storms, because the streams in this vicinity frequently change their channels and carry a large amount of solid material which they deposit rapidly. One of the worst streams to contend with is the San Gabriel river, which carries a maximum flood flow of 35,000 sec. ft. The track is carried across this stream on a 700-ft. steel bridge, but in recent years the channel has filled up so that in 1914 and again this year the river broke through the railway embankment west of the bridge, doing a large amount of damage to railway property and to the surrounding country.

The second line of the Santa Fe, between Los Angeles and San Bernardino, is well away from the hills and little trouble has been encountered for a number of years. This line crosses the Santa Ana river several times, but no difficulty has been experienced previously. This year when 7 in. of rain fell in two days in an area with a normal annual rainfall of 12 in. this stream overflowed the entire valley, running over the track in a number of places and doing a limited amount of damage to the railway. It soon receded, and this line was placed back in service in a short time.

On the Fallbrook line, extending from Oceanside to Fallbrook, a distance of 18 miles, the water was over the track from one to five feet for almost the entire distance. While this line has always given trouble since it was built in 1882, it has never been as seriously wrecked as at this time, the entire line being put out of commission and practically all the bridges being washed out.

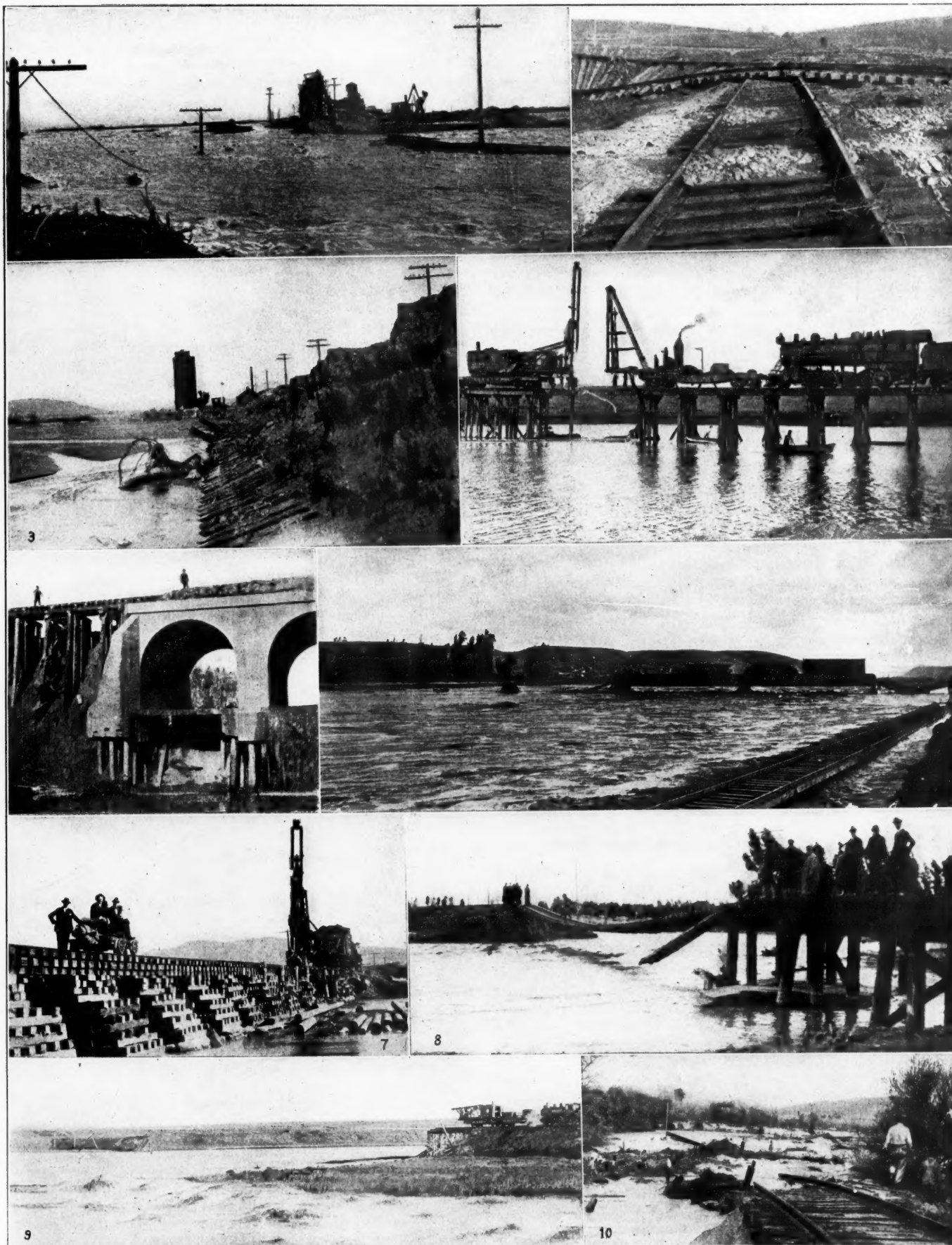
The greatest damage occurred on the line extending south from Fullerton to San Diego, a distance of about 100 miles. Over the entire area traversed by this line the average annual rainfall is only about 10 in. In the storm of January 16 to 18 approximately 6 in. of rain fell, followed during the second storm by 4 in. more. On account of the small normal rainfall throughout this district the Santa Fe

had never built steel structures across the different streams on this line, but had depended upon pile structures and arches. The experience this year demonstrated, however, that these streams carry so much debris at times such as these, that it will be necessary to adopt other construction. There were a number of high bridges on this line where it crossed marsh lands, in which many bents were lost. At one place 1,200 ft. of line, including bridge and embankment, were washed out. The Santa Ana river flooded the territory between Fullerton and Orange for a distance of five miles, washing out the embankment for from 10 to 50 ft. at the ends of each of several bridges. One structure in this section of the line consisted of four 60 ft. and eleven 90 ft. girders. During the floods two of the 60 ft. girders disappeared completely. Practically all of the bridges south of Orange were also damaged or entirely washed out by other streams. About 15 miles from San Diego the track was buried under mud slides for about three miles. The cuts which stood normally on a slope of two or three to one, became so soft that the material flowed down over the track, and cattle and horses stepping into it were unable to free themselves. A force of 100 teams was required to restore this track.

Following the first storm, forces immediately undertook the reconstruction of this line and it was practically ready to return to operation when the second storm came. As it became evident that the line was again badly damaged, the general superintendent and the chief engineer went over it at once and detailed a roadmaster, an engineer, or a foreman of bridges and buildings, to assume charge of the reconstruction work at each serious washout. Telephone service was soon re-established, and these men were enabled to communicate direct with the general superintendent and chief engineer, who had established headquarters at San Diego, and who despatched men and materials to the various points as required. Supplies were taken to the different locations by boat, automobile and motor trucks, according to the local conditions.

The division storekeeper at once took charge of the material yard at San Diego, and forwarded the material to the various locations required. The purchasing department at Los Angeles bought and forwarded all the various supplies which could not be furnished from the division storeyard at San Bernardino. To distribute this material from San Diego the bridge caps and stringers were made up into rafts and towed as great a distance as 60 miles along the ocean front to the mouths of the streams over which they were to be used, or to beach landings opposite the work, from which points they were hauled to the desired locations by teams. In some instances the material had to be transferred across streams by ropes, and pulled up the opposite side by men and by motor cars. Where the sites of the trouble were accessible by water the rafts were towed to the desired locations by flat-bottomed boats. Where the rafts were taken ashore along the beach the tow boats held them just outside of the breakers until a long rope was stretched from the shore, this rope being 1,200 ft. long in some instances. After the boat let go, a team pulled the raft shoreward through the breakers.

In order to take care of the men distributed along the line it was necessary to purchase and equip a large number of tents for their use at points where there were not sufficient accommodations for them. This material also had to



(1) The crossing of the San Gabriel river on the Pasadena line. (2) Destruction on the San Diego line after second wash-out. (3) A wash-out through the station grounds at Sierra. (4) Pile drivers closing 1,200 ft. gap in the San Diego line after second wash-out. (5) The wings washed out and the foundation exposed at a double 20 ft. by 8 ft. arch culvert. (6) Four hundred foot trestle gone and parallel track washed along bank in the foreground. (7) Timber cribbing supported on sand-sack foundation. (8) Two bents remaining of a 98-ft. pile bridge across the Santa Ana river. (9) A 149-ft. truss and 400 ft. of pile trestle lost north of Oceanside. (10) One thousand ft. of track washed out near Sierra.

Railroads Suffer Severely from Floods in Southern California

be brought in by boat. Over a considerable portion of the line the water in the sloughs could not be used for boilers, and at Del Mar it was necessary to restore a two-mile pipe line in order to keep the pile drivers and engines operating.

In starting the reconstruction work attention was first directed to the replacing of the larger structures and every effort was made to pass the pile drivers over the smaller washouts by means of cribbing, "shoofly lines," etc. In a number of instances structures were missing which had been rebuilt only a few days before. Immediately after the second storm, one pile driver was started south from Fullerton, being carried over the smaller openings by cribbing placed by extra gangs. This driver was followed by a second one secured from another division which drove temporary structures at these smaller openings. Two drivers were working between San Diego and Santa Ana at the time of the second storm and they were immediately started at work on reconstruction. A pile driver was built on a flat car, and started north from San Diego, and two others were built there and sent to intermediate points on barges where they were transferred to the track. All drivers worked continuously until the line was open. The bridges were built of four or five-pile bents and where low the stringers were interlaced and were not bolted. At one place where a driver could not be brought in, a sand-sack foundation was placed for a timber crib and the track carried on this. At another point a pile trestle 400 ft. long remained after the first storm, but after the second storm it had disappeared and there was a clear opening of 1,200 ft. Because of the poor foundations at this point 70-ft. piles were required for this structure. No brace piles were driven at first, but after the line was open for traffic the drivers were employed in placing these brace piles and in redriving structures at the points where the track was carried by cribbing temporarily.

After the first examination immediately following the storm it was estimated that the line would be closed for 30 days or more. By taking advantage of the possibility of bringing in materials on the ocean and by careful organization, service was resumed on February 18, less than three weeks after the second storm. The line was, however, out of service from the date of the first storm on January 17, or a total of 32 days.

USE OF HAND BRAKES UNLAWFUL

The United States Circuit Court of Appeals, ninth circuit, in a decision handed down February 14, has declared the use of hand brakes in the ordinary management and movement of freight trains in interstate commerce unlawful. This agrees with the decision by Judge Martin A. Knapp, in the case of the Virginian Railway, reported in the *Railway Age Gazette*, May 14, 1915, page 1018, and has somewhat broadened the application of the law. In the Virginian case very long trains, running at 10 miles an hour, were controlled wholly by hand brakes on descending grades at certain points; whereas in the present case, which arose on the Great Northern Railway, the statement of facts says that the trains were equipped with power brakes which were operated by the engineman "in connection with the hand brakes." The decision, which reverses the judgment of the district court for the Eastern district of Washington, is summarized as follows:

"It was the intention of Congress by the power brake provision of the safety appliance acts (27 Stat. 531; 29 Stat. 85; 32 Stat. 943) to make it unlawful to require brakemen to use hand brakes in the ordinary management and movement of freight trains in interstate commerce.

"In an act, the express purpose of which is to relieve brakemen from the danger of using hand brakes, a provision that the train shall be so equipped as to run without requiring the use of the hand brakes is a prohibition against the use of the hand brakes in the ordinary movement of trains.

"The language of the act was equivalent to declaring that after the date named freight trains should not only be equipped to run, but should actually be run without requiring brakemen to use the common hand brake."

The decision is by Circuit Judge William B. Gilbert, concurred in by Judge W. W. Morrow. After citing the statute, Judge Gilbert says: "Aside from the language of the act and the amendments, there is external evidence that it was the intention of Congress thereby to make it unlawful to require brakemen to use hand brakes in the ordinary management and movement of freight trains in interstate commerce. This is shown by the title of the act and the reports of committees during the passage of the bill through Congress." And he quotes from the report of the House committee and from expressions in the annual reports of the Interstate Commerce Commission to show that the intent of the law was as he has concluded. "To say that trains shall be provided with power brakes, and in the same breath to say that the carrier may refuse to use them, is to contradict the very purposes and terms of the act."

Circuit Judge Erskine M. Ross dissents from the decision, holding that the words of the statute, which do not expressly forbid the use of hand brakes, cannot be taken to imply such prohibition. He says that the decision in the Virginian case does not sustain the majority view in the present case, because there the air brakes were not used at all.

REPORT ON MILFORD COLLISION

The Interstate Commerce Commission has issued a report, signed by H. W. Belnap, chief of the division of safety, dated March 14, giving the results of the investigation of the rear collision of passenger trains on the New York, New Haven & Hartford, near Milford, Conn., February 22, in which 10 persons were killed and 276 injured.

The statement of facts, with slight exceptions, is substantially the same as that given in the *Railway Age Gazette* March 3, page 385. From investigations and comparisons made by officers of the mechanical department of the road, it is believed that the rupture in the air-brake hose, which caused the sudden stoppage of the leading train, could be caused by a loose steam hose, if the hose should come in contact with the ties and be thrown violently upward. The boiler of the colliding locomotive, which was thrown a long distance over to the left, was found to have in one end a hole 6 in. square. The rear end of the standing train, at the time of the collision, was about 450 ft. ahead of the home signal. An engineman approaching from the east has a good view of this signal for a distance of 1,800 ft.

Following the testimony of the trainmen and others having immediate knowledge of the collision and the attending circumstances, the report gives a summary of the testimony of General Manager C. L. Bardo. Replying to a question as to what should be done to prevent accidents of this character, Mr. Bardo said:

"That is an exceedingly difficult question, because of the fact that regardless of what mechanically or electrically combined devices may be developed, you still go back to the human element, and there is a very grave question in my mind as to the wisdom of taking from the shoulders of a well-trained, well-disciplined engineer the responsibility for doing certain things and placing it upon a man who by the very nature of things can't be either so well trained or so well disciplined. In other words, you simply transfer the responsibility from the shoulders of one man to those of another, or you do a more harmful thing, you divide it between two men. Our experience and I think the experience of every railroad and of every institution where mechanical appliances are used, is that mechanical appliances will fail and when they fail you never can be quite sure in which direction that failure is going to go, because while it is planned and inherently set up that the failure must be in the interests of safety, the failures to which we refer in what has often been heralded as the next step in safe railroad operation, namely, the automatic train stop, is not a safe failure. It becomes at once a dangerous

failure, because that takes away from the engineer the use of his intelligence and his training and his knowledge in the control and the handling of the air brakes in his train. . . . The application of the brakes upon a long freight train is something that must be handled with a great deal of intelligence, and I doubt if we will ever find a device which is going to absolutely supplant the intelligence of the engineer in that direction. We are just as anxious as anybody to find some way in which we can reduce the hazard of railroad operation."

The government inspectors made a careful examination of the roadway and the signals at and near the point of collision. It is estimated that a person walking fast would in two minutes reach the point where the flagman of the standing train was struck by the following train. Tests of the signal apparatus "confirm the testimony that the signals had been working properly before the accident and at the time of the accident; and the system of inspection and maintenance of the apparatus is good."

The report here refers to investigations of other rear collisions on this road, in 1913, when trains were running near together, and says:

"In view of these disasters it does not appear that passenger trains in through service with but few, if any, stops to make should be permitted to run so close together, if dependence for protection is to be placed upon the flagman. Protection by flagman is ineffective if sufficient time is not available for the flagman to get a proper distance from the rear of his train to afford opportunity properly to perform his duty.

"It is true that on many railroads, particularly in suburban traffic, trains are run with apparent safety very close together, but these trains are not run at such high speed, stops are frequent, signals are much closer, and trains are comparatively light.

"If, leaving New Haven, these trains had been spaced farther apart, and each had maintained the same relative rate of speed, the flagman of train No. 79 could probably have gotten back far enough to have warned the engineer of train No. 5, had that engineer seen him, or at least to have placed torpedoes on the rail that would have been sufficient warning, so that some one on the locomotive could have brought the train to a stop and thus have averted the collision. . . .

"Under normal operating conditions the headway between the two trains involved in this collision, No. 5 and No. 79, is sufficient to permit a flagman to get back a proper distance in case of an emergency stop, even though there were no signal protection. There appears to be no reason why this practice should not have been followed on the day of the accident. Even with the trains leaving New Haven 10 minutes apart, if the leading train should fail to make its schedule time the trains would gradually close up and the only knowledge that the following train would receive that it was overtaking the preceding train would be the signal indication. For this reason it is imperative that a train should immediately slow down upon receiving the first caution signal and be governed in like manner thereafter by each succeeding caution signal."

From the evidence of the witnesses and calculations made on a diagram of the road, the inspector concludes that train No. 5 had been passing, without decreasing speed, the four or five distant signals between New Haven and the point of collision, and that these signals indicated caution. Continuing, he says:

"The record in this case, together with a careful consideration of the diagram, brings forcibly to mind that the rules permit the distant signal indication to be observed with less exactness than is the home signal indication. Distant signal indications are as positive as home signal indications. Under the present practice of the New Haven Railroad, the distant signal at caution indicates to the engineer that he should prepare to stop at the next signal. This is practically the

same as the standard code of the American Railway Association for three-position signaling. This is not as definite and clear-cut a rule as that given for the indication for the home signal, which says 'stop,' leaving in the latter case nothing to the discretion of the engineer. Without such a positive rule, especially with men feeling the pressure to make time, there is a great chance for error in reading, or for looseness in observance of, the distance signal. To be consistent with other signal rules which require a positive definite action on the part of the engineer, in order to provide proper safety in the operation of its trains, existing rules should be so modified that at the distant signal in the caution position a train shall be brought under control as quickly as possible by the engineer and maintained in such a state until the indication of the next succeeding signal is accepted. Such an observance of the caution indication would not mean delay at every distant signal, but with proper signal locations, after the second train had slowed down for the first caution signal encountered, it should receive clear signals thereafter, unless it were overtaking the preceding train. Such a practice may occasion slight delays in automatic signal territory with long blocks; nevertheless, speed must always be subordinate to safe operation.

"This accident again directs attention to the fact that careful and competent engineers, aided by signal systems of the most highly approved type, are not adequate fully to guard against the occurrence of collisions of this kind.

"As all persons who could by any possibility explain why Engineer Curtis failed to obey the indication of the signals set against his train were killed in the collision, it is idle to speculate concerning the reasons why the signal indications were not obeyed; the plain, outstanding fact is the only thing that can profitably be considered. In the face of that fact there seems to be no room for doubt that to prevent accidents of this nature between high-speed trains running on short headway, automatic devices which will enforce obedience to signal indications should be used."

Mr. Belnap here quotes from the report of the commission on the accident at Westport, Conn., October 3, 1912, in which the railroads were called upon to "unitedly experiment with the automatic train device until a device of practicability for general use shall be available."

Commenting on what the New Haven road has done in the way of testing automatic train stops, the present report says:

"It is probable that many devices that were rejected by Mr. Morrison as being unsuited for use on his road, are capable of development for use with an electric propulsion system, but the plans presented did not so indicate, and therefore they were rejected. The commission has examined plans and specifications of practically all the automatic train-stop devices that have been offered for use within the past ten years, and has tested a considerable number of such devices under actual service conditions. Many of the devices thus examined and tested have been considered useful, and quite capable of development to meet general railway operating conditions. It is believed that while the New York, New Haven & Hartford Railroad is limited to a particular type of automatic train stop, no insuperable obstacles exist to prevent the development of alternating current devices that will prove suitable for use under the system of train operation used on the electric division of that road."

In conclusion the report calls attention to the presence of steel cars in train No. 79, and says that "it is without doubt due to the fact that the equipment involved was of steel construction that loss of life in this accident was not much greater."

INDIA.—The Eastern Bengal Railway has been authorized to carry out a reconnaissance survey for a meter gauge line from Badargunj, a station on its Katihar-Kaunia section, to Mahimgunj, a distance of about 48 miles.

THE STATE'S RESPONSIBILITY FOR LOSS OF LIFE*

By L. F. Loree

President of the Delaware & Hudson Company

The direction of industries that no effort has yet sufficed to free from loss of life and permanent physical injury to workers imposes responsibilities that put mere lip service to shame. Whether those who bear obligations of management for the great industries of Pennsylvania carry those responsibilities with adequate realization of their seriousness is to be determined by acts, not words. But it may now be said, for those in charge of the railways and the anthracite mines, that they will always in the future be ready to do what they have done in the past, to consider every suggestion honestly intended to diminish these losses, to enter upon every safe experiment that bears reasonable evidence of practicability, to adopt any device or method that approves itself to those who comprehend the difficulties to be overcome.

Losses of life and limb from industrial accidents are appalling whether many or few; if one human life is lost or one human form is mutilated by an accident that might have been prevented, the result is appalling in a degree that no statistical summary or comparison can accentuate. Such losses are irreparable and without possible compensation. They should compel seriousness of thought and sobriety of speech. It would be as evil to consider pecuniary profits as an offset or excuse as it would be unutterably wicked to seek to derive political advantage or notoriety from these conditions.

The railway industry represents the utmost effort of mankind to overcome, by the artificial arrangement of weaker natural forces, one of the greatest and most universal of the laws of nature. Nature ordained that everything ponderable should be inert and, again, that man should survive and progress only by conquering inertia. Man can create nothing, but by changing the locations and relations of things can set in operation natural forces that are creative. The railway is humanity's mightiest response to this condition of his existence. All other forces oppose the effort but by controlling the relatively puny force of the expansive gas which is formed by water heated to 212 degrees Fahrenheit, man is able to hurl railway trains, often weighing six millions of pounds or more, over hills and across rivers and valleys and through mountains, alike in the heat of summer and the freezing cold of winter. This is warfare, not cruel and criminal warfare of man against man for commercial or political advantage or to appease the ambitions or jealousies of leaders; but the warfare of man, industrious, organized and capably led, against reluctant nature, fought in obedience to the divine command that toil shall be the source of food and shelter and moral as well as material advancement. Those who realize the obstacles that nature erects and constantly renews in protest against this rude interference with her rule of stability, wonder at the efficiency of the machine by which it is so regularly conquered, not at the fact that it sometimes falters or that men who waver or become inconstant in devotion to duty are sometimes killed or injured. These losses must not be called inevitable for the struggle and hope to prevent them must never relax or grow dim, but it is true that, considered in the light of the difficulties encountered, there is no department of human activity in which more has been accomplished, there are few in which even an approximate meed of success has been attained.

There is, however, one large class of wholly preventable railway accidents, but the means of prevention is in the hands of the state, as a political organization; the railways themselves are powerless. What has the political organization of

the state done to prevent these accidents? The answer is, absolutely nothing. Fifteen lives per day are, on the average, lost in the United States by accidents to persons that occur because these victims are trespassing without right or claim of right upon railway property, against the rights of the railway and often endangering the safety of travelers. A few states have especially penalized such trespass, but Pennsylvania, although such legislation has frequently been asked for by railway officers, has done nothing. The following are facts reported by the Interstate Commerce Commission:

Year ended with June 30	Number of passengers and employees killed	Number of trespassers killed
1911.....	3,519	5,284
1915.....	2,031	5,084
Decrease, 1911-1915; number	1,488	200
Per cent	42.28	3.79

These figures speak for themselves. They show that while the annual loss of life in the field to which the efforts of the railway managers must be confined has been reduced almost one-half, the losses in the field in which the state alone can be effective have been reduced scarcely at all. A law of this state, effective since 1911, forces an extra and superfluous man to share the risks of nearly every train crew, but no law has ever been passed to protect any would-be trespasser upon railway property from the consequences of his trespass.

There is another direction in which proper legislation would materially aid in the reduction of railway accidents. It is notorious that much more than half the train accidents that occur are consequent upon failure to obey orders and observe rules that, properly carried out, would have obviated all danger. Many such disobediences and violations of rules take place without producing accidents, but every one of them is a trespass against the order of the community in that it endangers the safety of persons and property. No political leader or legislator is so ignorant as not to know these facts or that a long step toward the reduction of accidents would be taken in the enactment and enforcement of adequate penalties to punish these violations of order. No such penalties have been provided in Pennsylvania and unless the organizations of railway labor change their views and cease to protect conduct which threatens the lives of their own members, as well as of the public, none will be provided.

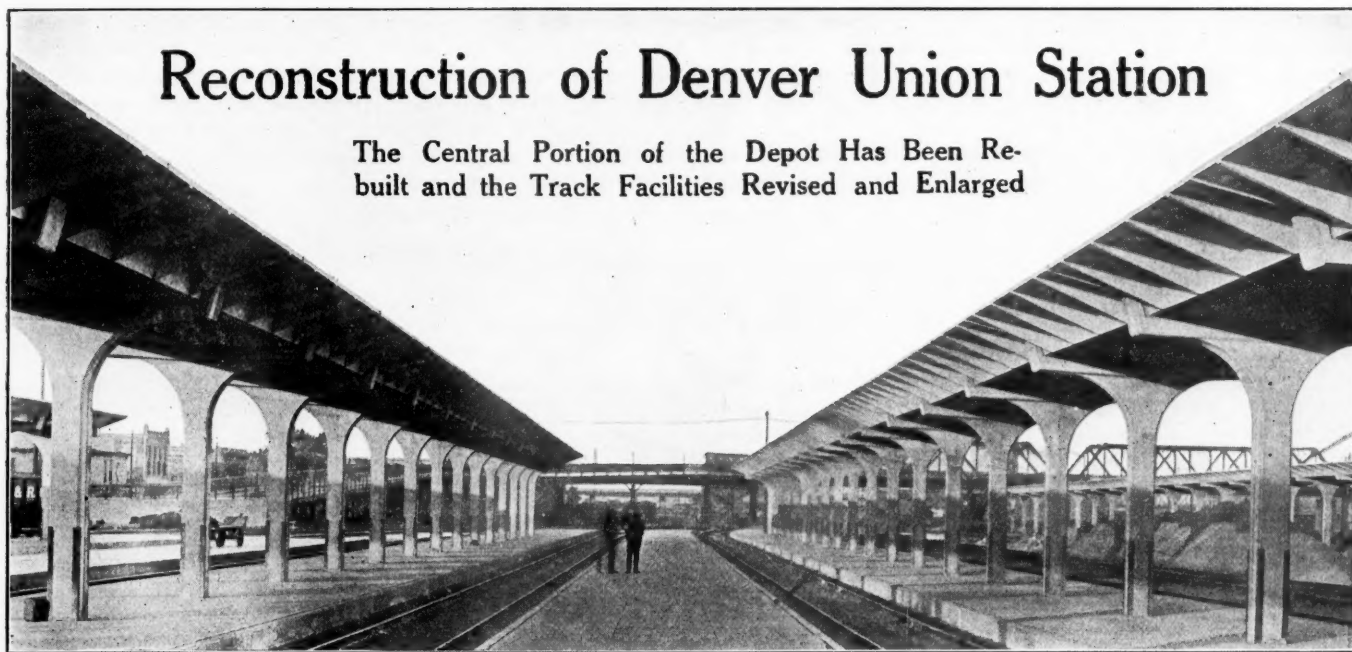
These suggestions are not made in a spirit of mere criticism. They are prompted by a firm conviction that the most salutary result that could follow this conference would have come about if it should impel the political leaders to emulate, in the fields peculiarly their own, the efforts and efficiency that have so greatly reduced the dangers of the most dangerous of all vocations.

CARRIERS AND MANUFACTURERS.—To the average citizen, a great railroad system represents one of the largest aggregations of capital and resource, but a railroad is really one of the small potatoes in comparison with certain commercial establishments. Take, for instance, the Willys-Overland Company, controlling an automobile plant, two tire factories and one starting and lighting plant. This aggregation of energy and capital was not in existence ten years ago, but it expects during 1916 to do a business of \$250,000,000. One of the big packing companies, during 1915, handled a business of \$500,000,000. In contradistinction, the Southern Pacific Company, operating over 12,000 miles of railway and several steamship lines, with property approximating \$909,000,000, and with possibly 40,000 employees, is fortunate if it can earn a gross return of one-half of that of the automobile concern. The manufacturing plants pursue the even tenor of their way and pile up their remarkable net earnings with a proper protection of their resources and revenue; but poor Mr. Railroad is hammered from early to late; shot at, turned inside out, sat on and otherwise made to mark time by the public.—*Southern Pacific Bulletin.*

*From a statement made before a conference of industrial leaders and legislators of the State of Pennsylvania, called by Governor Brumbaugh.

Reconstruction of Denver Union Station

The Central Portion of the Depot Has Been Rebuilt and the Track Facilities Revised and Enlarged



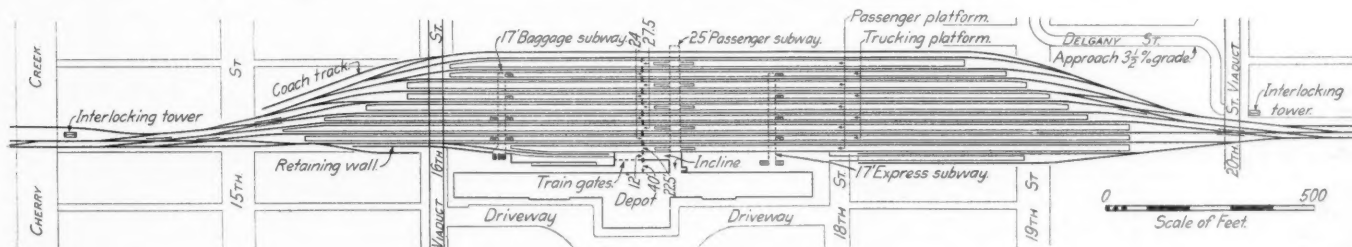
Passenger Platforms With Train Sheds and Baggage Platforms.

Extensive improvements to the Denver union station facilities, including the rebuilding of the main portion of the station building and the entire reconstruction and enlargement of the track facilities will be completed about July 1, 1916. This work, which has been under way since September 1, 1914, has involved a total expenditure of approximately \$3,800,000, about two-thirds of which was for land.

The old station, which has been a landmark for many years, was built in 1880 by the Union Depot & Railway Company, three-fifths of the stock of which was owned by the Union Pacific and the remaining two-fifths by the Colorado & Southern and the Denver & Rio Grande, respectively. These three roads were the only ones entering Denver at the time this station was built. When the Santa Fe, Burlington and Rock Island entered a few years later, they became tenants in this station, while the Denver & Salt Lake

especially inconvenient. Access to the platforms for passengers, baggage and express, was over a grade crossing with the tracks opposite the center of the station, necessitating the dividing of all trains standing in the station. The number of tracks in the old station was limited to 12, none of which was long enough to hold the longest trains using the station. The tracks and platforms were also entirely unprotected from the weather.

While not a through station, in that all trains terminate at Denver, except three or four on the Union Pacific running between Kansas City and Ogden, the track layout is of the through type. All Union Pacific, Burlington and Rock Island trains and those of the Colorado & Southern from Cheyenne, Wyo., and Georgetown, Colo., enter the station from the east, while the trains of the Santa Fe and the Denver & Rio Grande and Colorado & Southern trains from



Track Plan at the Denver Union Station as Revised

(the Moffatt line) operates a station of its own a short distance from the Union station.

Preparatory to the reconstruction of the station facilities, the Union Depot & Railway Company was reorganized as the Denver Union Terminal Railway Company, the six companies using the facilities becoming equal owners in the property. The property is limited to the Union station and its facilities between the east line of Twenty-first street and the east line of Cherry street. It owns no equipment and performs no switching service. Each road provides its own terminal facilities other than the passenger station, makes up its own passenger trains and otherwise cares for its own equipment.

While sufficient for the requirements at the time the station was built, the facilities have been inadequate and antiquated for a number of years. The track arrangement was

Pueblo and Leadville, enter from the west. The problem at Denver is complicated by the somewhat unique condition that the Colorado & Southern lines to Leadville and Georgetown, and some other minor branch lines are narrow gage, making necessary the use of three-rail tracks in the station and through the throats at each entrance.

An average of 140 scheduled trains are handled daily. This movement is materially increased during the summer tourist season, an average of 200 trains arriving and departing daily during July and August, 1915. During the month of August, alone, a total of 24,550 passenger cars and about 600,000 passengers passed through the station. This traffic is concentrated very largely in morning and evening rush periods, an average of 45 trains being handled daily in less than two hours in the morning during the past summer. An average of 70 tons of mail and 5,000 pieces of baggage are

also handled daily. About half the baggage is local and the remainder is transferred from train to train. However, with the exception of the Union Pacific trains referred to above, no trains operate through Denver. There is a considerable transfer of through tourist and standard sleeping cars between the eastern and western roads, necessitating a considerable amount of switching on the station tracks. With this exception the trains are made up by the different roads before being backed into the station.

ALTERATIONS TO THE BUILDING

The old building, which was two stories in height, consisted of a central or waiting room portion surmounted by a high tower with wings 60 ft. wide and 350 and 260 ft. long on the west and east ends, respectively. The old building was of native buff Colorado lavastone. The present re-

The new central portion of the building is 165 ft. long by 140 ft. wide and three stories high. It is of steel frame construction with brick walls faced with brown sandstone for 5 ft. above the foundation with gray terra cotta above, except on the front, where granite is used for a height of 5 ft. The front of the building faces on a 50-ft. driveway along which cabs deliver their passengers near the main entrance. All mail, baggage and express are delivered directly to the proper quarters in the wings without interference with passenger and cab traffic at the main entrance.

A broad marquis with a wire glass roof extends over the sidewalk between the two main entrances in the front of the building. These two entrances lead through vestibules directly into the main waiting room about which are grouped all the facilities required by the passengers. This waiting room is 110 ft. long by 100 ft. wide with the ceiling 65 ft.

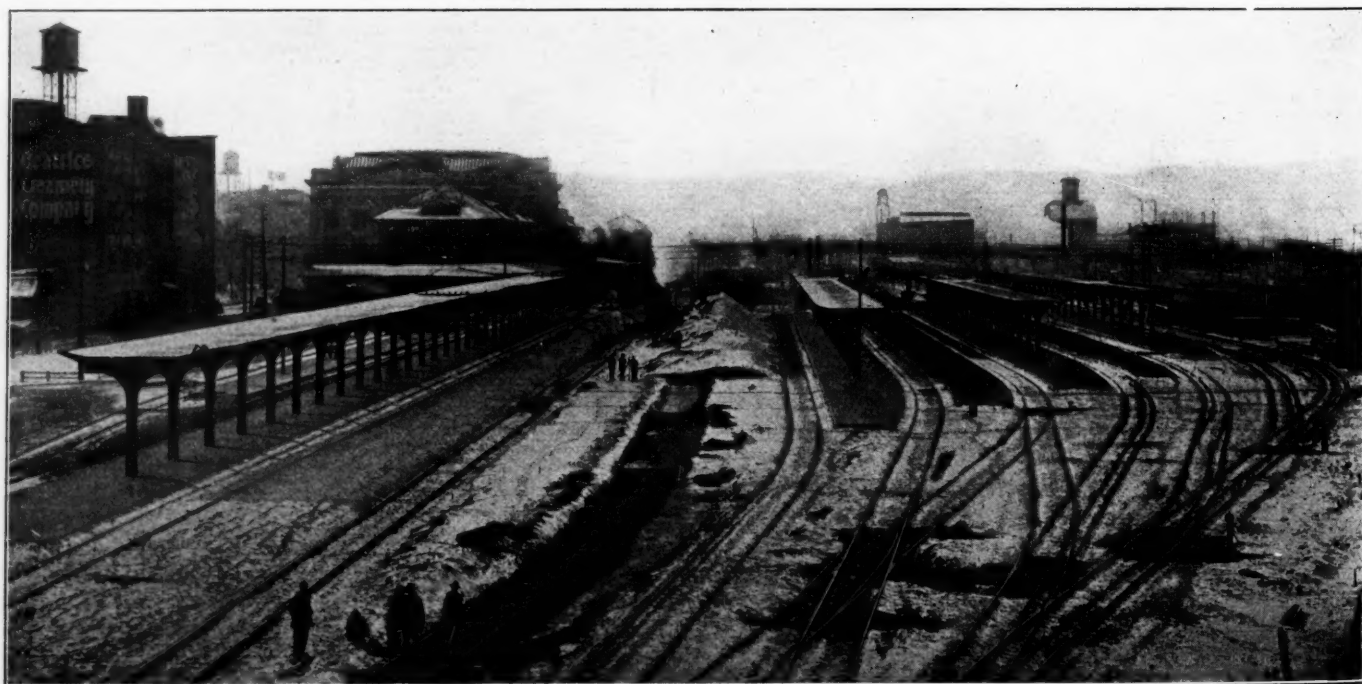


Floor Plan of the Revised Station

construction of this station involves the complete rebuilding of the central portion used by the public to provide increased and modern facilities but leaves the wings undisturbed except for the revision of the interior arrangement and the construction of a 95-ft. extension to the east wing to provide quarters for some of the tenants displaced in the rearrangement of the central portion of the building. In addition to the offices of the Terminal Company, the tenants include the local division officers of the Union Pacific, the Colorado & Southern, the Pullman Company, and the Western Weighing Association, all of which have space above the first floor. The Adams, American and Wells Fargo express companies and the railway mail service have space in the wings on the first floor.

above the floor. It has an art marble floor with a Colorado Yule white marble wainscot 7 ft. high, above which are white plaster panels. An arched and tinted plaster ceiling is provided. In addition to three large electroliers suspended from the ceiling, a number of bracket lights are provided on the side walls, the lighting system being direct throughout the station. Natural light is secured primarily from five large arched windows on the track side of the waiting room and from three large arched windows on the front. A considerable portion of the waiting room floor is occupied by seats on the backs of which are small electric lights. The radiators are housed within these seats.

The ticket office occupies the street side of the waiting room between the two entrances with 21 windows for the



View from North End of Yard During Construction, Showing Platforms and Three-Rail Tracks at the Right

use of the railroads, the Pullman Company and the information bureau. The various other facilities required by the passenger face directly on this waiting room except the

emergency hospital and an immigrant room in the east wing. Although only a limited amount of immigrant traffic passes through the Denver station, special quarters are provided



Interior of the Waiting Room Showing Ticket Office

baggage room which is in the west wing and is reached through a corridor, and the dining room similarly located in the east wing. Among the special facilities provided are an

here with a direct entrance from the driveway and a special corridor leading to the trains.

Three sets of four doors each lead from the waiting room



The New Central Portion of the Station Building with the Old Wings at Each End

into the concourse 160 ft. long and 40 ft. wide. An iron grating separates this concourse from an incline leading to the passenger subway. Seven train gates are placed in this grating near the west end of the concourse. The concourse and approach to the subway are entirely enclosed with steel construction encased in concrete with brick walls supporting glass panels above and wire glass skylights, making this concourse particularly light. It will be heated in the winter time. The incline leading to the passenger subway is 12 ft. wide and is on a slope of 1 in 9. It leads directly into the passenger subway which extends under the tracks with entrances and stairways 6 ft. wide and leading to the passenger platforms. This subway is 25 ft. wide and 8 ft. high and is lined with white enameled brick.

The station end of the subway also opens into an exit for incoming passengers, enabling them to pass out onto the street without going through the main waiting room or coming in contact with the outgoing passengers except in the subway itself. This exit is on a slope of 1 in 10. Two other subways are provided, one for baggage near the west end of the platform opposite the baggage room and the other for mail and express opposite the east wing. These subways are 12 ft. high and 17 ft. wide and are provided with 14 electric elevators of 7,500 lb. capacity each at the station end and at each trucking platform.

REVISING THE TRACK LAYOUT

As outlined above, it was in track capacity and arrangement, that the station facilities were most inadequate and it is in this regard that the greatest improvement has been made. In the first place the grade of the tracks has been raised 4 ft. to give the required head room for the subways under the tracks, eliminating all necessity of crossing them at grade. The track capacity has been materially increased in the new layout. Nine tracks are provided in addition to one running track, each of which will hold two of the longest trains commonly handled. In addition two stub tracks holding 8 cars each have been built for express service and one for baggage and one for private cars.

The raising of the grade of the tracks required 55,000 cu. yd. of filling material which was secured from the excavation for the building and the subways. This excavation for the latter involved serious difficulties as it penetrated a stratum of water bearing sand.

A three-track throat is provided at each end of the station. Electric interlocking plants to be erected at these points will control all train movements. No. 9 turnouts and slip switches have been used for the standard gage track construction work with 90-lb. A. R. A. rail and gravel ballast.

To accommodate the narrow gage trains of the Colorado & Southern the three outside station tracks and the running track are built as three-rail tracks and the same construction has been extended through the throats of the yard. A further difficulty resulted from the necessity of using special frogs to transfer the narrow gage tracks from one side of the standard gage tracks to the other to bring them along the platforms. To maintain the alinement of these tracks as far as practical, the intermediate frogs are curved although the main rail frogs are straight. Because of the complexity of the problem the entire switch layout was drawn on a large scale in the office and all measurements were placed on this drawing. The tracks were then staked out from the measurements thus recorded.

The measures adopted to avoid interference between passengers and baggage, express and mail trucking at this station are somewhat unusual, entirely separate platforms being constructed for each purpose. The passenger platforms between each two tracks are 17½ ft. wide and from 1,200 to 2,050 ft. in length. The trucking platforms between each two alternate tracks are 14 ft. wide and of similar length.

The platforms are of concrete with their tops 9 in. above the top of rail.

Interference with passengers is further eliminated by placing all service lines on or along the trucking platform. Water hydrants are placed in recesses at intervals in this platform, these recesses near the passenger subway also containing steam connection. A Pintsch gas line is laid in the ballast beyond and about 3 in. below the top of the ties along this same platform with connections level with the top of rail at intervals of a car length.

The passenger platforms are protected with umbrella type concrete sheds while the trucking platforms are not covered. The sheds on the passenger platforms are of unit construction, 6,700 lineal ft. being provided. With this form of construction the pedestals were built in place in the ground. Above this point each panel consists of a post and two roof slabs cast separately in a slab yard adjacent to the work. The panel length is 20 ft. To erect the shed, the vertical posts were set in place in the pedestals with a locomotive crane and a one-inch grout joint. The two slabs were then placed on the supporting posts. To overcome expansion stresses a double vertical post was built at intervals of about 340 ft.

The change in grade of the tracks through the station made necessary the alteration of the viaducts at Fourteenth and Sixteenth streets. The changes at Fourteenth street consisted principally in the relocation of the supporting bents to permit the rearrangement of the tracks. At Sixteenth street it was necessary to raise the viaduct 4 ft. at a cost of \$35,000. To secure permission to close Nineteenth street, which formerly crossed the tracks at grade, it was necessary to construct an approach 800 ft. long to the Twentieth street viaduct from Nineteenth street via Delgany street at a total cost of \$45,000.

The prosecution of this work has been greatly complicated by the necessity of executing it without interference with the heaviest passenger traffic ever handled through the station. Previous to the withdrawal of the summer schedule on September 1, 1915, it was possible to accomplish little on the track work because of the continued interference with traffic. After a number of trains were taken off on this date, it was possible to make greater progress, taking one or two tracks out of service at a time.

Plans were prepared and the construction work has been handled under the direction of a committee composed of the chief engineers of the six owning roads, with H. W. Cowan, chief engineer of the Colorado & Southern, chairman, until his death on May 29, 1915, when he was succeeded by J. G. Gwyn, chief engineer, Denver & Rio Grande. C. C. Post, construction engineer Denver Union Terminal Railway, has been in direct charge of the work on the ground. Gove & Walsh, Denver, were the architects for the station building, and Stocker & Fraser, Denver, were the contractors. The Van Sant-Houghton Company, San Francisco, were the contractors for the umbrella sheds and subways, and Hinchman & Renton, Denver, were contractors for the platforms, sewers, yard piping and retaining walls. The track work was done by company forces.

THE CAPACITY OF TROOP TRAINS.—The Queensland Railways having a 3-ft. 6-in. gage recently carried 26 officers and 759 foot soldiers, together with their baggage, in two trains, each of 20 cars and weighing 325 tons. The New South Wales Railway, with 4-ft. 8½-in. gage transported the same number of troops in two trains consisting of 19 cars each and weighing 475 tons. On December 30 last the Egyptian Delta Light Railways (4-ft. 8½-in. gage) transported 28 officers and 700 men in one train consisting of 21 cars and weighing 143 tons, and 21 officers and 560 men, together with their baggage in another train consisting of 23 vehicles weighing 150 tons.

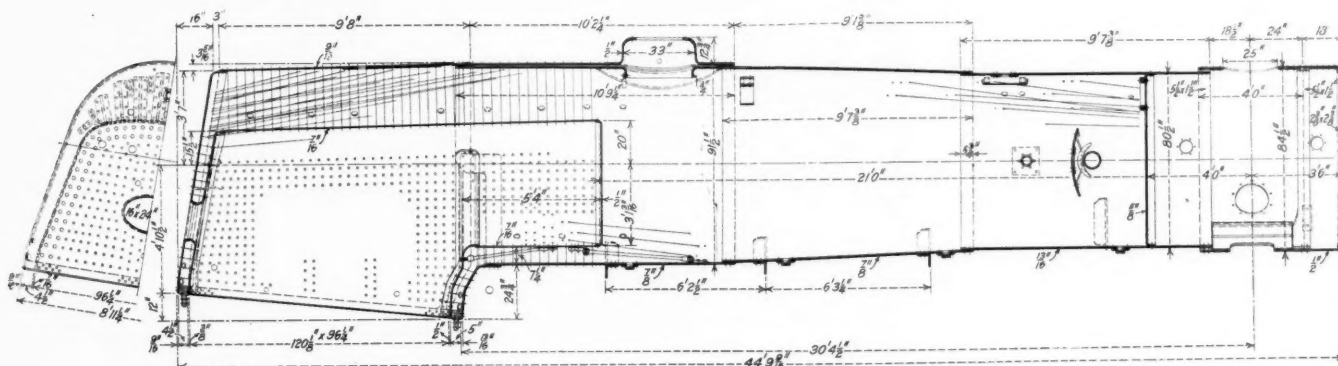
Norfolk & Western Mountain Type Locomotives

Total Weight, 341,000 lb.; Tractive Effort, 57,200 lb.;
Comparison With Other Locomotives of the Same Type

The Norfolk & Western has under construction at its shops at Roanoke, Va., eight locomotives of the Mountain, or 4-8-2, type. The total weight (estimated) of these engines is 341,000 lb., of which 236,000 lb. is on the drivers. The table gives a comparison of the engines with six other Mountain type locomotives. In comparing the Norfolk & Western loco-

greater firebox surface. It will be noted that the new engines have considerable more grate area than any of the others with the exception of the Great Northern engine.

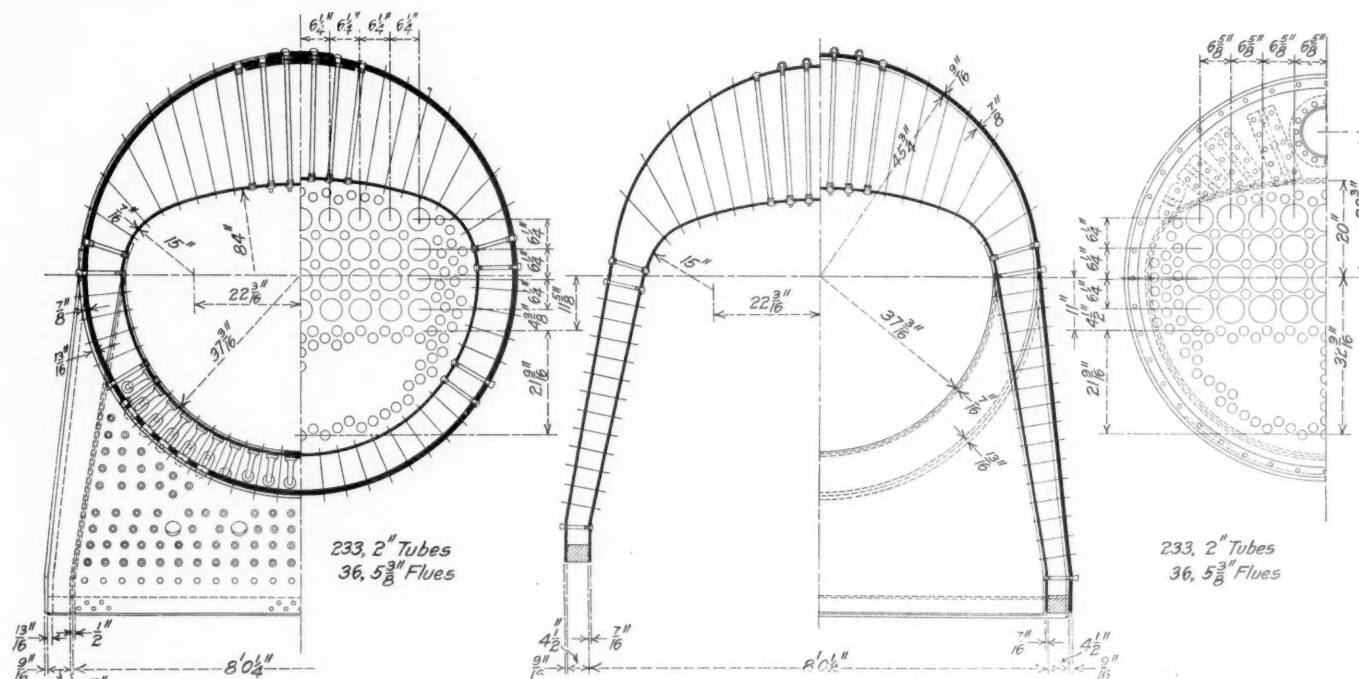
The Norfolk & Western engines have a total wheel base, engine and tender, of 72 ft. 11 in., a total engine wheel base of 40 ft. 5 in. and a driving wheel base of 18 ft. 9 in. The



Boiler Used on the Norfolk & Western Mountain Type Locomotive

motive with that of the Chesapeake & Ohio it will be seen that the latter develops a maximum tractive effort of 58,000 lb., as against 57,200 lb. for the Norfolk & Western engine. The Chesapeake & Ohio engine has 62 in. driving wheels as against 70 in. on the new locomotives, the cylinders being the same in both cases, 29 in. by 28 in., but the difference in the

tender has a capacity for 9,000 gal. of water and 14 tons of coal. The engines are all to be stoker fired, four of them being equipped with the Hanna stoker and four with the Standard stoker. Their extreme length is 81 ft. 10 3/4 in. and the total weight of engine and tender in working order is estimated at 487,700 lb. The driving wheels are 70 in. in



Sections of the Boiler of the Norfolk & Western Engine

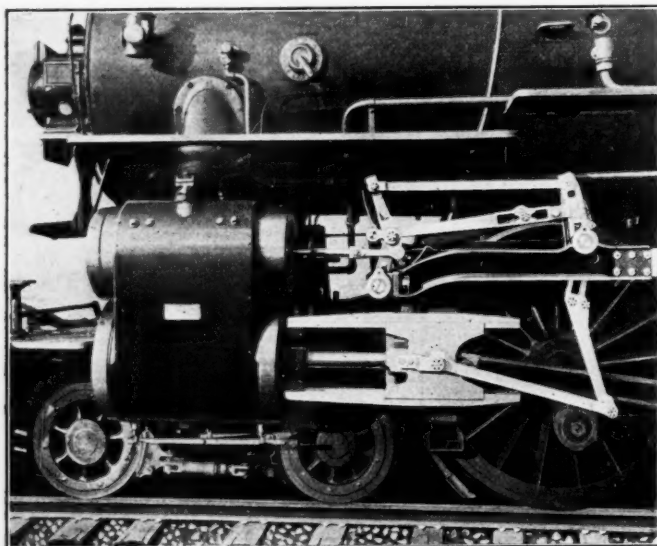
driving wheel diameter which favors the Chesapeake & Ohio engines in the development of tractive effort is compensated for in the Norfolk & Western engine by a boiler pressure of 200 lb. as against 180 lb. on the Chesapeake & Ohio engine. In point of heating surface the latter engine has somewhat the advantage in the tubes, but the Norfolk & Western has a

diameter with 12 in. by 14 in. main journals and 11 in. by 14 in. journals on the other axles. The leading engine truck wheels are 37 in. in diameter with 6 in. by 12 in. journals and the trailing wheels are 42 in. in diameter with 8 in. by 14 in. journals. The engines have 16 in. piston valves and the valve stem guide is cast integral with the back head of the

TEST OF THE YOUNG VALVE AND VALVE GEAR

Comparative tests made by the Grand Trunk on two Pacific type locomotives of the same class, one equipped with Young valves and valve gear and the other with ordinary piston valves and the Walschaert valve gear, show a creditable performance for the Young valves and valve gear. This gear, which was described in the *Daily Railway Age Gazette* of June 11, 1915, page 1284, was the first of this type to be applied to a locomotive. It is the invention of O. W. Young who was for some years in charge of valve gear design for the American Locomotive Company, and it is controlled by the Pyle National Electric Headlight Company, Chicago.

The gear was designed primarily to give a better and



Young Valve Gear Applied to a Pacific Type Locomotive

more economical steam distribution. Of special interest is the performance of the engine at starting and at high speeds. A maximum cut-off of 88 per cent can be obtained with no detrimental effects to the other events of the stroke and it is possible to clear the cylinders of steam with practically no back pressure. This is shown by the indicator card, Fig. 1. This card was taken at starting, the speed being 5 m. p. h.

this card also show how easily the cylinder was cleared of the steam on the return stroke. This is the result of the extra long travel given the valve by the valve gear and the exceptionally open construction of the valve itself. A card taken at a speed of 40 m. h. p. with the Young gear is shown in Fig. 2, and Fig. 3 shows a card taken at the same speed with the Walschaert gear. The characteristics of these two cards are as follows:

	Fig. 2 Young	Fig. 3 Walschaert
Type of gear.....	Young	Walschaert
Speed	40 m.p.h.	40 m.p.h.
Boiler pressure	185 lb.	185 lb.
Initial pressure (cylinder).....	141 lb.	141 lb.
Mean effective pressure.....	76 lb.	45 lb.
Driving wheel diameter.....	72 in.	71 in.
Tractive power	15,440 lb.	9,270 lb.
Horsepower	1,645	988
Water per i. hp. hr.....	24.55 lb.	27.20 lb.

This comparison shows the advantage the Young gear has over the Walschaert gear, the conditions being the same in

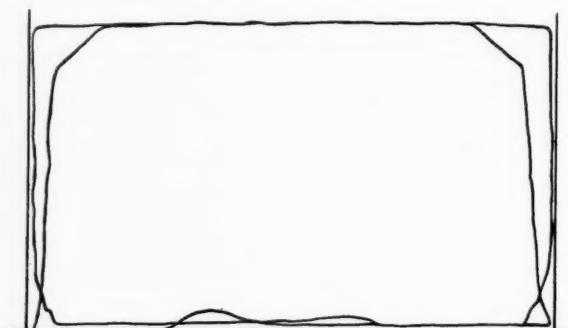


Fig. 1—Starting Indicator Card Taken with Young Valve Gear—Speed 5 Miles per Hour

both cases. Still more interesting, however, is the performance of the Young valve and valve gear at high speeds. An indicator card taken at a speed of 77 m. p. h. is shown in Fig. 4. The back pressure and compression lines are especially noteworthy. The back pressure is only 2.5 lb. and is remarkably constant throughout the return stroke when the speed at which the engine is running is considered. The compression curve shows that at even this high speed the cylinders are so well freed of steam that the compression could easily be begun at a point earlier in the stroke.

A study of these cards indicates that with this valve and

AVERAGE TEST RESULTS PER SINGLE TRIP WITH YOUNG AND WALSCHAERT VALVE GEARS

Item	Freight Service		Passenger Service		Engine 298 Compared with 293—Per cent	
	Young	Walschaert	Young	Walschaert	Freight Service	Passenger Service
Type of valve gear.....	298	293	298	293	.....	.....
Number of engines.....	1	1	3	3	.....	.....
Number of round trips.....	45	41	8.66	9	+ 9.8	— 3.7
Number of cars.....	1,612	1,485	.....	.....	+ 8.5	.....
Gross weight of train, tons.....	169	169	176	176	.....	.....
Train miles	7,605	6,844	1,526	1,584	+11.1	— 3.6
Car-miles	272,512	250,965	.....	.....	+ 8.5	.....
Ton-miles	11.92	13.31	8.82	10.40	—10.4	—15.2
Coal consumed, tons.....	3.20	3.9	11.58	13.35	—18.	—13.2
Coal per car-mile, lb.....	8.65	10.56	.....	.....	—18.1	.....
Coal per ton-mile, lb.....	173,044	187,250	107,602	118,860	— 7.5	— 9.4
Water evaporated, lb.....	7.25	7.08	6.13	5.73	+ 2.4	+ 6.9
Water evaporated per lb. of coal, lb.....	180	178	180	177	+ 1.1	+ 1.6
Boiler pressure, lb per sq. in.....	24.14	22.33	39.71	39.65	+ 8.1	+ 0.15
Speed, m.p.h.	7 hr. 1 min.	7 hr. 38 min.	4 hr. 27 min.	4 hr. 26 min.	— 8.	.....
Actual running time.....	1 hr. 36 min.	3 hr. 57 min.	23 min.	27 min.	—59.5	—16.6
Detentions	11	18	12	13	—38.9	— 7.6
Number of stops	40	17	41	26	.....	.....
Temperature, deg. F. ....	.....	.....	.....	.....	.....	.....

The initial pressure is 184 lb. which is one pound less than the boiler pressure. The mean effective pressure is 173 lb., which gives an indicated tractive effort of 35,200 lb. This is 5,600 lb., or almost 19 per cent greater than the rated tractive effort of the engine. The back pressure lines of

gear a smarter engine is obtained at starting, more power is available and greater speeds are obtainable than with similar engines equipped with the Walschaert gear. In the report of the tests, shown below, it was stated that there scarcely seems to be any limit to the speed that this engine

could make with the reverse lever in the twenty-first notch (almost at center) and the throttle only open a crack.

The tests were made on Pacific type locomotives of the same size and class, using superheated steam and having 23-in. by 28-in. cylinders with 185 lb. boiler pressure. Engine 293 was equipped with the Walschaert valve gear and engine 298 with the Young valves and valve gear. Both locomotives had made substantially the same mileage since general shopping and were in practically the same condi-

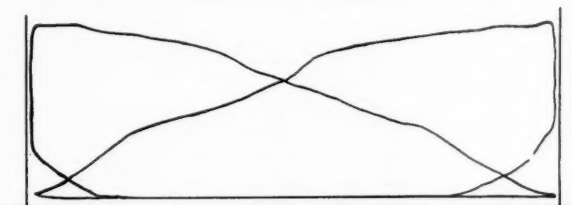


Fig. 2—Young Valve Gear Indicator Card at a Speed of 40 Miles per Hour

tion. Engine 293 had drivers 71 in. in diameter, which gave it a rated tractive effort of 30,000 lb., while the drivers on engine 298 were 72 in. in diameter, giving it a rated tractive effort of 29,600 lb. One round trip was made with each engine in freight service and three in passenger service between Battle Creek, Mich., and Chicago. While the locomotives are generally used in passenger service they were tested on freight runs for the purpose of seeing how the Young gear would perform in that service. The average

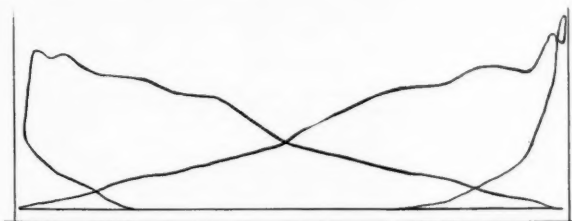


Fig. 3—Walschaert Valve Gear Indicator Card at a Speed of 40 Miles per Hour

results of the tests are shown in the table. These results show a slight increase in evaporation in favor of engine 298 indicating that it had slightly better steaming qualities but the percentage decrease in the coal consumed per car-mile in passenger service and per ton-mile in freight service is far greater than that in the evaporation. In this connection it must be noted, however, that the tests are not strictly comparable because of the difference in temperature on the days the tests were made and also, in the case of the freight

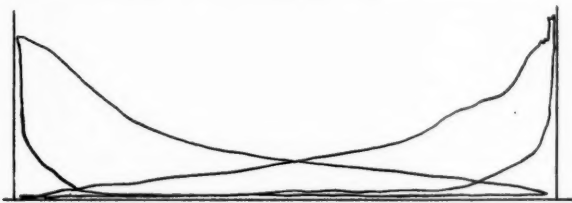


Fig. 4—Young Valve Gear Indicator Card at a Speed of 77 Miles per Hour

tests, because of the great difference in the time of detentions.

The general observations made during the test showed that engine 298 had a marked advantage over engine 293 in starting trains and, as above noted, in making speed. Engine 293 was stalled on a grade about one mile west of Battle Creek with a train of 1,550 tons while engine 298

with poorer rail conditions made the same grade with practically the same tonnage at a speed of 13 to 15 m. p. h. In the handling of the engine during the tests it was found that the Young gear was operated with ease at high speeds and that there was no vibration in the valve stem at any time, indicating that the gear is under no severe strains. This was to be expected as the gear is some 1,100 lb. lighter than the Walschaert gear, and the Young valve is decidedly lighter than the valve ordinarily used. In this particular instance the reciprocating weight of the valve and gear has been reduced 40 per cent.

While this gear has not been in service long enough to determine its actual maintenance cost it is expected to prove more economical to maintain than the Walschaert gear and the ordinary piston valve. The Young valve is lighter due to the packings being carried in the valve bushing instead of the valve and this feature also permits the valve to be made much simpler in construction. The gear itself is also of simple construction. It derives its motion direct from the crosshead, there being no revolving parts. It is so designed that it can be made standard on a wide range of locomotives of various designs, and the valve can be used with any other type of valve gear. With the application of this valve and gear to locomotives it is possible to obtain the same results with a smaller diameter of valve than when the Walschaert gear is used because of the increased port openings made possible by the increase in the length of travel of the valve.

JAMES J. HILL ON THE DEMANDS OF THE TRAIN EMPLOYEES

"Railroad employees could not choose a more inopportune time to ask for a general advance in wages," said James J. Hill in a statement issued last week. "When the devastating war in Europe is over the question confronting American wage-earners will be that of finding a market for their labor instead of fixing a price for it.

"We have a feverish prosperity that may vanish overnight," Mr. Hill continued. "The great bulk of the business now taxing the capacity of our railroads arises from the war necessities of Europe. The money our people are getting in payment for their products is being provided on the forced credit of the combined nations of Europe. They are raising these hundreds of millions by piling up to enormous heights the debts of their governments, thus building up a great financial burden that must be borne by future generations.

"The instant that peace is in sight (and no one can tell how soon this may be, because Europe cannot go on much longer destroying lives and property at this unprecedented rate) all this flood of orders for war materials at high prices will suddenly cease. Europe will then begin the slow and painful process of recovering from the great losses of the war. Then the United States, which has been profiting by Europe's war necessities, will have to share her burden of the cost of the war. In these days of closely related markets one great nation cannot enjoy prosperity for any length of time while a large part of the rest of the world is in financial distress.

"With the war over, we will no longer see the railroads blocked with merchandise bound for the seaboard, or our harbors choked with freight waiting for ships to carry it to Europe. How severe will be the reckoning the world must pay can only be conjectured, but we all know it must be paid.

"With such a situation confronting us, this can hardly be regarded as a happy moment for railroad employees, and especially those highly paid employees in the train service, to ask for higher wages.

"American railroads to-day pay the highest wages in the world, out of the lowest rates in the world, after having set down to capital account the lowest capitalization per mile of

all great countries of the world. No other occupation and no other employer of labor in the country can match this record. The pay-roll now absorbs 45 per cent of the gross earnings of the railways. When business falls off it will be difficult to reduce wages correspondingly. The higher rate of wages established now would have to be adhered to in the period of severe financial readjustment which must come very soon.

"These 300,000 trainmen, less than a fifth of the railroad workers, are now highly paid, and their working conditions are most favorable. In what other occupation can workers earn two and three days' pay in one day, and be able to spend many days at home in consequence? These men all live comfortably, which is as it should be. The wage rate enables them to spend liberally for their families. Their consumption is an important factor in creating employment for other industries and raising the general level of prosperity.

"But continually increased pay and decreased working hours for the employee means increased cost of transportation, and all the people must in the end pay the bill in higher rates. A railway can pay out only what it takes in. It takes in nothing except what the public pays to it for service. The logical conclusion, that every concession to employees must in time be reflected in a rise in rates and paid for by the people, is one which they too often overlook.

"The greatest factor making for high prices is the wage rate. Everybody knows that labor cost is the principal item in all forms of industry. The wage rate has been rising steadily in this country. Powerful forces are back of this movement. It has public sympathy. As the labor supply diminishes, wages rise still more. High wages and high prices work in a circle. Every rise of one is reflected in a rise of the other. But somebody has to pay these wages. They do not come out of the air. In the end labor suffers when the business no longer pays a profit and the payrolls cease entirely by the closing up of an industry no longer profitable.

"But the railroads must go on. Capital once invested in the business cannot be taken out. The railroads need hundreds of millions of new capital every year. How is this capital to be obtained unless investors are convinced of the ability of the carriers to earn a fair return?"

SENTINEL LOW WATER ALARM

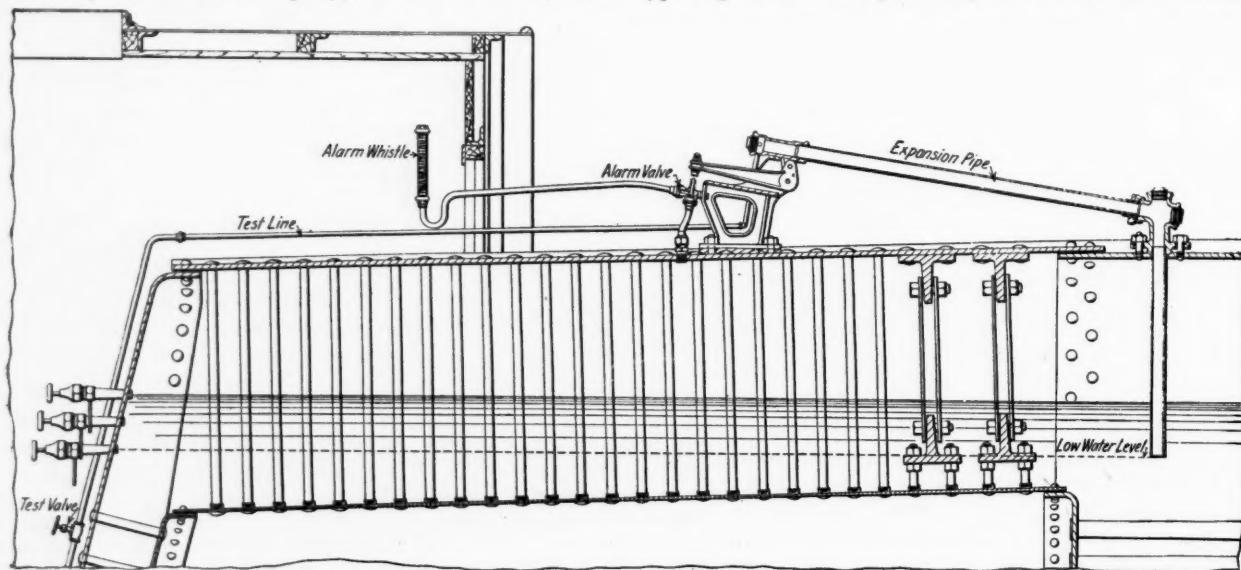
The drawing shows a sectional view of a low water alarm, designed for locomotive service, which has been placed on the market by the Pilliod Company, 30 Church street, New

York. The device, which is known as the Sentinel low water alarm, is simple in construction and specially designed to withstand the requirements of locomotive service.

The boiler connection is made at a cross-tee which is attached to the boiler shell, preferably just over the high point of the crown sheet. To this is secured the drop pipe, the lower end of which is extended down to the predetermined low water level. The expansion element, one end of which is secured to the cross-tee, is a 1½-in. seamless copper tube and extends along the top of the boiler to a bracket in which its movement is guided and to which is secured the whistle valve and its operating mechanism. The latter consists of a bell crank, the short arm of which is connected to the expansion element. The longer arm is placed in position to operate the whistle valve when the expansion element is filled with steam. Assuming that the water level of the boiler is such as to seal the open end of the drop pipe, any steam that may have been imprisoned in this pipe and the expansion element will be condensed by the radiation from the latter. The parts will consequently be filled with water drawn from the boiler. As long as the open end of the drop pipe remains sealed the parts will, therefore, be filled with water which quickly chills to a temperature below that of the steam and water within the boiler. If the water level falls below the end of the drop pipe the water in the expansion element will flow out by gravity and the copper tube will immediately be filled with steam from the boiler, the temperature of which will cause the lengthening of the expansion element, with a corresponding movement of the bell crank lever which will open the whistle valve. When the normal water level in the boiler is again restored the open end of the drop pipe will again be sealed, the condensation of the steam thus trapped in the device causing it to fill with water and again cool off.

In order to test the condition of the device at any time the water may be drawn off from the expansion element through the test pipe inserted in the outer end of the element. By opening the valve in this pipe the cool water in the element will be forced out and replaced by hot water from the boiler. If the device is in working order this will cause the whistle to blow, the condition of the entire mechanism thus being ascertained in a few seconds. The size and location of the parts is such that there is very little likelihood of the passages becoming stopped up. Clean out plugs are provided, however, at both ends of the expansion element and at the upper end of the drop line so that all passages are readily accessible for cleaning.

This low water alarm is already in service on a number of locomotives and will be applied to a number of Mountain type engines now being built by the Norfolk & Western.



Sectional View Showing the Sentinel Low Water Alarm on the Boiler

General News Department

The roundhouse of the Boston & Maine at Plymouth, N. H., was destroyed by fire March 30; loss, including damage to six locomotives, \$60,000.

The "restaurant car" is now the place where passengers on Pennsylvania Railroad trains are to go for their meals. The term "dining car" has been discontinued.

A despatch from Seward, Alaska, says that more than 1,000 workmen are now engaged in the construction of the Government Railroad. Trains are running from Anchorage to Eklutna.

Clifford Thorne, chairman of the Iowa Railroad Commission, on March 29 issued a statement announcing his candidacy at the coming primary for the republican nomination for Congressman from the First Iowa district.

The executive committee of the four brotherhoods of railroad train service employees will meet in Chicago on April 29, it is announced, to receive the replies of the railroads to their demands for the so-called "eight-hour day" and time and one-half for overtime, which were presented on March 30, and to formulate their plan of action in view of the railroad replies.

Clifford Thorne, chairman of the Iowa Railroad Commission, has announced his resignation as chairman of the committee on state and federal regulation of the National Association of Railway Commissioners, because the state has no appropriation available to defray the expenses of attendance upon the hearings at Washington in connection with the Newlands resolution.

The National Industrial Traffic League has issued a circular to its members intimating that the possibility of a railway strike growing out of the demands of the train and engine employees will be discussed at its next meeting, to be held at Baltimore this week. The resolutions, urging arbitration of the controversy, which were passed by the Chamber of Commerce of the United States, and those passed by the Chicago Association of Commerce urging arbitration of the demands which either side may make on the other, are quoted in the circular for the information of the members, who are urged to inform themselves of the situation in view of the possible discussion at the meeting.

The Pennsylvania reports that in the year ending December 31, 1915, the third successive year in which no passenger was killed in a train accident on its lines, 4,364,519 observations were made to determine how well the rules and signals were being obeyed. These tests show that but one error occurred in every 1,110 trials, giving a record of 99.9 per cent of absolute perfection. In four classes of tests, including obedience to various stop signals, not a single failure on the part of any employee was detected throughout the year. In the shifting of trains, 68,941 observations were made and 17 errors recorded. There were 342,991 tests for obedience to the safety rules for track workmen, and in only 73 cases were these rules disregarded in any way. The record of accidents to employees shows a reduction of 11 per cent from the figures of 1914.

About 300 employees of the New York Central at the passenger car yards, Mott Haven, New York City, struck on April 5 and caused delays to many evening passenger trains. The strikers included car cleaners, air brake inspectors, car inspectors, carpenters, trackmen, machinists, blacksmiths and car repairers; and also some baggage handlers at the terminal. The strikers are members of the American Federation of Railroad Workers, which claims to have 27,000 members in the United States. Refusal by the railroad to deal with the union in a demand for shorter hours and an increase of 3 per cent in wages was one of the causes for the trouble given by the strikers. Also, several old-time employees who are officers of the labor union were recently discharged. The company put new men at work at once, having, evidently, been prepared for the strike.

A. G. Whittington, general manager of the International & Great Northern, in connection with his efforts to secure more

economical loading of freight cars, has sent out to agents a circular showing, by monthly records, what improvement has been made in this matter; and to give point to his appeal he gives a statement of the average loading of cars throughout the system as shown in the records of the principal commodities; together with the percentage of contents to capacity of car. Taking the records as a whole, the average loading in the months of 1916, so far, has been 17.2 tons per car as compared with 14.1 tons per car in 1915; and the percentage of contents to capacity this year is 49.2 per cent as compared with 41.5 last year. Many commodities which ought to be loaded in full carloads show pretty low percentages. Among the best percentages are: Brick, 47 cars, this year, 84.8 per cent; last year, 70.1. Cement, 145 cars, this year, 73.3 per cent; last year, 83.7 per cent. Cotton, 1,098 cars, this year, 38.6 per cent; last year, 40.6 per cent. Lumber, 262 cars, this year, 81.4 per cent; last year, 76.4 per cent. Ores, 226 cars, this year, 94.1 per cent; last year, 89.3 per cent. Stone, sand and gravel, 1,360 cars, this year, 89.1 per cent; last year, 89.8 per cent.

Valuation Analysts Wanted

The United States Civil Service Commission announces that applications will be received until May 9 for the position of valuation analyst in the division of valuation, Interstate Commerce Commission, where several vacancies are to be filled. Two grades of eligibles will be established: grade 1, with salaries from \$3,600 to \$5,000, and grade 2, from \$1,800 to \$3,300. For the first year the salary of any position, usually, is the minimum named, but in cases of exceptional qualifications this rule may be disregarded. The duties of this position will be to compile data and to prepare complete, concise and logical reports upon valuation subjects, and to analyze, edit and digest reports submitted by sections of the division of valuation. Applicants should have had actual experience and possess the ability to prepare reports in a concise, clear and logical form. Applicants for positions under grade 1 must show that they have had at least 18 months' responsible, satisfactory experience in the final preparation of financial, statistical or valuation reports upon public utilities. For grade 2 positions, such experience for at least six months must be shown. In each case this experience should have been gained in the employment of a public authority or commission engaged in the effectual regulation of public utilities, or with an important public utility, or in investigations of a similar character. Experience with mercantile concerns, with large utilities in routine positions, or with small utilities with limited operations will not be accepted as qualifying experience in this connection. For positions under grade 1, applicants must have reached their thirtieth but not their sixtieth birthday and for grade 2 they must have reached their twenty-fifth but not their fiftieth birthday on May 9. Persons who desire this examination should apply for form 2039 and special form, stating the title of the examination for which the forms are desired, to the United States Civil Service Commission, Washington, D. C., or to one of the local boards, sitting in prominent cities.

Business Organizations Oppose Railway Strike

Commercial clubs and business men's organizations of various kinds in many cities throughout the United States have passed resolutions protesting against the idea of a strike on the part of the railway train-service employees to enforce their demands for increases in wages. The resolutions adopted by the Chamber of Commerce of the United States, the Chicago Association of Commerce, the Business Men's League of St. Louis, and the St. Paul Association of Commerce have already been mentioned in the *Railway Age Gazette*. Other more or less similar resolutions urging arbitration as a means of settling the controversy have been adopted by the Commercial Club of St. Paul, Commercial Club of Topeka, Kan., Chamber of Commerce and Federation of

Allied Interests of Tulsa, Okla., Commercial Club of Valley City, N. Dak., Chamber of Commerce of Thomas, Okla., Chamber of Commerce of Aurora, Mo., Commercial Club of Crocker, Mo., Commercial Club of Salem, Mo., Greater Muskogee Association, Muskogee, Okla., Yakima Commercial Club, North Yakima, Wash., Chamber of Commerce of Des Moines, Iowa, Business Men's Club of Tupelo, Miss., Retailers' Association of Oklahoma City, Okla., a business men's meeting at Burlington, Colo., Chamber of Commerce, Hugo, Okla., a citizens' meeting, Simla, Colo., Commercial Club, Fertile, Minn., Rotary Club, Oklahoma City, Okla., Chamber of Commerce, Madill, Okla., Commercial Club, Rolla, Mo., business men's meeting, Colby, Kan., Commercial Club, Ada, Okla., Advertising Club, Lebanon, Mo., Commercial Club, Fargo, N. Dak., mass meeting of citizens, Calhan, Colo., business men's meeting, Flagler, Colo., Commercial Club, Norton, Kan., business men's meeting, Smith Center, Kan., Business Men's Association, Olathe, Kan., Commercial Club, Grand Forks, N. D., and the Association of Commerce, Minot, S. D.

The resolutions of the board of Directors of the Commercial Club of Topeka, Kan., referred the matter to the club's standing committee on transportation for an impartial investigation of such phases of the situation as affect the interests of commerce and the public. The Chamber of Commerce and the Federation of Allied Interests of Tulsa, Okla., recommended that the differences between the organizations of railroad employees and the railroads "be submitted to an arbitration committee appointed by the railroad interests, the organizations of railroad employees, and such other parties as shall be selected by both to represent the great commercial and industrial interests of the United States, preferably from among the officers or directors of the Chamber of Commerce of the United States, and that the decisions of this committee be accepted as final and binding."

The Commercial Club of Aurora, Mo., in its resolutions "solemnly asks the said railroad companies and the brotherhoods of engineers, firemen, conductors and trainmen to submit their differences and disagreements to arbitration, and in good faith work to an end that will avert an awful catastrophe."

The Commercial Club of Crocker, Mo., voted to send a letter to the four organizations of train employees, asking "that the interests of yourselves, those of the railroad companies and those numerous classes whom you so diligently and faithfully serve may appeal to you to submit the demands to a board of arbitration for candid consideration." The Commercial Club of Salem, Mo., in its resolutions said: "Arbitration, as a rule, settles all such controversies in the end, so we ask that it be so settled now, or at least an attempt be made to do so." The Business Men's Club of Tupelo, Miss., expressed its views in part as follows: "We, the Business Men's Club of Tupelo, Miss., knowing that the people pay the bill, and that this is a big public problem that concerns the rights of every American citizen, and believing railway wages are already as high, or higher than those of other positions of like requirement, do not believe the railroads of this country are in a financial condition to meet such a demand, or that the request of the unions of train employees is reasonable, sound or logical. Neither have they the right to try to force from the people through the railroads such excessive demands, nor to paralyze all American industry by a great strike."

Most of the resolutions refer to the disastrous effects on the public that would be produced by a cessation of transportation and point to the fact that a method is already provided by law for the arbitration of such controversies.

Penalties to Be Imposed for Violation of Car Service Rules

The Commission on Car Service of the American Railway Association, of which Fairfax Harrison, president of the Southern Railway, is chairman, recently submitted a report to the executive committee of the association, giving notice that effective on June 1, 1916, it will impose penalties, as authorized, for violation of the car service rules, which provide for the return of foreign cars to the owning roads. The report of the commission, which was approved by the executive committee and ordered transmitted to the members of the association, is as follows:

"The acute shortage of cars for grain loading in the West during the past few weeks which has been the subject of inquiry, consideration and report by the Commission on Car Service, has led the commission to a renewed study of the basic principles underlying the car service problem on American railways. The commission feels that it is its duty to lay before the American

Railway Association a frank statement of the different views which have been entertained on this subject, with its recommendation in the premises, and to that end submits the following report:

"Since the development of the American railway system to continental proportions there have been two schools of opinion as to the rights of individual railroads to the possession and use of rolling stock.

"(A) The original principle was formulated when two railroads of separate ownership were first connected and interchanged their individual equipment in through service, and is based on recognition that ownership of a car involves the right to the prompt return of that car after it has fulfilled its immediate function of through service on which it had been forwarded. This principle has been the basis of all car service rules which have been recognized by American railroads, including those now in effect.

"(B) The other school of opinion, which has never as yet found expression in any car service rule, accepts the fact that the creation of through routes and through rates which carry a car far beyond the lines of the owning railroad and over the lines of several railroads, has in effect created a pool of all cars used in such service, and that existing car service rules do not effectively regulate such pool, although special equipment, as, for example, open cars, is ordinarily handled in accordance therewith. The principle proposed by this school of opinion is the effective regulation of such pool. A discussion of this plan is contained in an early report of this commission, which is hereto attached, as information.

"The commission is unanimous in the opinion that, whatever is the solution of the problem, the existing car service rules are not now enforced, and that their efficiency in principle has not been proved because they are not enforced. Having respect for the historical development of these rules, the commission is of opinion further that an earnest and sincere attempt should now be made to give them effect, in order that it may be proved once and for all whether or not they provide the machinery necessary for a correct solution of the problem.

"To that end the commission gives notice that, effective June 1, 1916, it will exercise not only the function of a mediator, as heretofore, but will impose penalties as authorized by the rules. The co-operation of all members of the association is earnestly invited."

"G. R. S." Block Signals

The General Railway Signal Company, Rochester, N. Y., in its recently issued bulletin, No. 128A, gives the names of 14 steam and seven electric railways on which its "A-P-B" automatic signals for single track are in use, as follows:

Steam Railways	Mileage
Buffalo, Rochester & Pittsburgh	150
Chicago & North Western	280
Chicago, Indianapolis & Louisville	140
Chicago, St. Paul, Minneapolis & Omaha	22
Great Northern	234
Lake Erie & Western	49
Lehigh & Hudson River	72
Lehigh Valley	59
Louisville & Nashville	267
New York Central (west of Buffalo)	20
Northern Pacific	627
Oahu Railway & Land Company, Honolulu, H. I.	23
Southern	17
Toronto, Hamilton & Buffalo	54
Total	2,014
Electric Railways	
Fort Wayne & Northern Indiana Traction Co.	50
Indiana Railways & Light Co.	6
Lehigh Valley Traction Co.	4
Puget Sound Electric Railway	20
New York State Railways (Rochester Lines)	74
Terre Haute, Indianapolis & Eastern Traction Co.	74
Union Traction Company of Indiana	81
Total	309
Total mileage, steam and electric railways	2,323

Traveling Engineers' Association

The annual convention of the Traveling Engineers' Association will be held at Chicago, September 5 to 8. The following subjects will be discussed at the meeting:

What effect does the mechanical placing of fuel in fire-boxes and lubricating of locomotives have on the cost of operation?

The advantages of the use of superheaters, brick arches and other modern appliances on large engines, especially those of the Mallet type.

Difficulties accompanying the prevention of dense black smoke and its relation to cost of fuel and locomotive repairs.

Recommended practice in the make-up and handling of modern freight trains, on both level and steep grades, to avoid damage to draft rigging.

Assignment of power from the standpoints of efficient service and economy in fuel and maintenance.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, date of next or regular meetings and places of meeting.

- AIR BRAKE ASSOCIATION.**—F. M. Nellis, 53 State St., Boston, Mass. Next convention, May 2-5, 1916, Atlanta, Ga.
- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.**—F. A. Pontious, 455 Grand Central Station, Chicago.
- AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.**—H. C. Boardman, D. L. & W., Hoboken, N. J.
- AMERICAN ASSOCIATION OF FREIGHT AGENTS.**—R. O. Wells, Illinois Central, East St. Louis, Ill. Next meeting, June 20-23, 1916, Cincinnati, O.
- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.**—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.**—E. H. Harman, Room 101, Union Station, St. Louis, Mo.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.**—E. B. Burns, 8 W. 40th St., New York.
- AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.**—H. G. McConaughy, 165 Broadway, New York.
- AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.**—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago. Next convention, May 22-24, 1916, Hotel Sherman, Chicago.
- AMERICAN RAILWAY ASSOCIATION.**—J. F. Fairbanks, general secretary, 75 Church St., New York.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.**—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, 1916, New Orleans, La.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.**—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March, 1917, Chicago.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.**—J. W. Taylor, 1112 Karpen Building, Chicago. Annual meeting, June 19, 1916, Atlantic City, N. J.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.**—Owen D. Kinsey, Illinois Central, Chicago. Annual meeting, July, 1916.
- AMERICAN SOCIETY FOR TESTING MATERIALS.**—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa. Annual meeting, June 27 to July 1, Hotel Traymore, Atlantic City, N. J.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.**—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.**—Calvin W. Rice, 29 W. 39th St., New York. Next meeting, April 11-14, Grunewald Hotel, New Orleans, La.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.**—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.**—E. R. Woodson, Rooms 1116-8, Woodward Bldg., Washington, D. C. Annual meeting, June 28, 1916, Hotel Statler, Detroit, Mich.
- ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.**—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association. Annual convention, October, 1916, Chicago.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.**—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J. Next meeting, May 17, 1916, Hotel Traymore, Atlantic City, N. J.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.**—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.**—P. W. Drew, Soo Line, 112 West Adams St., Chicago. Annual meeting, June 20-22, 1916, St. Paul, Minn.
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.**—G. P. Conard, 75 Church St., New York. Next meeting, June 27-28, Boston, Mass.
- BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.**—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.
- CANADIAN RAILWAY CLUB.**—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.**—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.**—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.
- CENTRAL RAILWAY CLUB.**—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CINCINNATI RAILWAY CLUB.**—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.**—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- FREIGHT CLAIM ASSOCIATION.**—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual session, May 17, 1916, Washington, D. C.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.**—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.
- INTERNATIONAL RAILWAY FUEL ASSOCIATION.**—J. G. Crawford, 547 W. Jackson Blvd., Chicago. Annual meeting, May 15-18, Hotel Sherman, Chicago.
- INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.**—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, August 29 to September 1, Hotel Sherman, Chicago.
- INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.**—A. L. Woodworth, C. H. & D., Lima, Ohio. Next meeting, August 15-17, 1916, Hotel Sherman, Chicago.
- MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.**—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.
- MASTER BOILER MAKERS' ASSOCIATION.**—Harry D. Vought, 95 Liberty St., New York. Annual convention, May 23-26, 1916, Hollenden Hotel, Cleveland, Ohio.
- MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.**—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, Wilmington, Del.
- MASTER CAR BUILDERS' ASSOCIATION.**—J. W. Taylor, 1112 Karpen Building, Chicago. Annual meeting, June 14, 1916, Atlantic City, N. J.
- NATIONAL RAILWAY APPLIANCE ASSOCIATION.**—C. W. Kelly, 349 People's Gas Bldg., Chicago. Next convention, March, 1917, Chicago.
- NEW ENGLAND RAILROAD CLUB.**—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.
- NEW YORK RAILROAD CLUB.**—Harry D. Vought, 95 Liberty St., New York. Regular meetings, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.
- NIAGARA FRONTIER CAR MEN'S ASSOCIATION.**—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.
- PEORIA ASSOCIATION OF RAILROAD OFFICERS.**—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.
- RAILROAD CLUB OF KANSAS CITY.**—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.
- RAILWAY BUSINESS ASSOCIATION.**—Frank W. Noxon, 30 Church St., New York. Annual meeting, December, 1916, New York.
- RAILWAY CLUB OF PITTSBURGH.**—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.
- RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.**—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.
- RAILWAY FIRE PROTECTION ASSOCIATION.**—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala., October 3-5, 1916, New York.
- RAILWAY REAL ESTATE ASSOCIATION.**—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 10, 1916, Chicago.
- RAILWAY SIGNAL ASSOCIATION.**—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September, 1916, Grand Hotel, Mackinac Island, Mich.
- RAILWAY STOREKEEPERS' ASSOCIATION.**—J. P. Murphy, N. Y. C. R. R., Box C, Collingwood, Ohio. Annual meeting, May 15-17, 1916, Hotel Statler, Detroit, Mich.
- RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.**—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Associations.
- RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.**—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.
- RICHMOND RAILROAD CLUB.**—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.**—L. C. Ryan, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.
- ST. LOUIS RAILWAY CLUB.**—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
- SALT LAKE TRANSPORTATION CLUB.**—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.
- SIGNAL APPLIANCE ASSOCIATION.**—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.
- SOCIETY OF RAILWAY FINANCIAL OFFICERS.**—Carl Nyquist, C. R. I. & P., 1134 La Salle St. Sta., Chicago.
- SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.**—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, April, 1916.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.**—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.
- TOLEDO TRANSPORTATION CLUB.**—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.
- TRACK SUPPLY ASSOCIATION.**—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.
- TRAFFIC CLUB OF CHICAGO.**—W. H. Wharton, La Salle Hotel, Chicago.
- TRAFFIC CLUB OF NEWARK.**—Roy S. Bushy, Firemen's Bldg., Newark, N. J. Regular meetings, 1st Monday in month, except July and August. The Washington, 559 Broad St., Newark.
- TRAFFIC CLUB OF NEW YORK.**—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
- TRAFFIC CLUB OF PITTSBURGH.**—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.
- TRAFFIC CLUB OF ST. LOUIS.**—A. F. Versen, Mercantile Library Bldg., St. Louis, Mo. Annual meeting in November. Noonday meetings, October to May.
- TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.**—J. F. Mackie, 7122 Stewart Ave., Chicago. Next convention, June 20, 1916, Toronto, Ont.
- TRANSPORTATION CLUB OF DETROIT.**—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.
- TRAVELING ENGINEERS' ASSOCIATION.**—W. O. Thompson, N. Y. C. R. R., East Buffalo, N. Y. Next meeting, September 5-8, 1916, Chicago.
- UTAH SOCIETY OF ENGINEERS.**—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.
- WESTERN CANADA RAILWAY CLUB.**—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
- WESTERN RAILWAY CLUB.**—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.
- WESTERN SOCIETY OF ENGINEERS.**—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY, 1916.

Average mileage operated during period.	Names of road.	Operating revenues			Maintenance of way and equipment		Operating expenses					Net from operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
270	Chicago & Erie.....	\$496,113	\$44,197	\$540,310	\$46,017	\$63,937	\$17,124	\$247,039	\$2,296	\$17,069	\$393,474	\$198,407	\$22,230	\$186,177	\$88,275
8,108	Chicago & North Western.....	4,432,731	1,575,095	6,007,826	660,870	1,140,584	106,676	2,723,683	54,207	4,831,927	4,831,927	1,869,613	385,000	1,484,033	43,591
9,373	Chicago, Burlington & Quincy.....	5,641,561	1,586,243	7,227,804	619,859	1,281,435	127,262	2,670,909	65,629	175,855	4,936,413	3,027,579	2,660,422	713,807	713,807
1,427	Chicago, Great Western.....	862,278	260,613	1,122,891	96,272	208,397	45,789	472,736	8,899	33,951	864,309	361,406	45,744	315,432	91,839
622	Chicago, Indianapolis & Louisville.....	393,596	135,604	529,200	43,916	98,469	19,532	217,826	375	18,285	397,259	181,345	27,455	153,887	71,335
13	Chicago Junction.....	187,595	17,776	205,371	19,769	17,776	1,438	113,876	.....	4,867	157,326	30,269	6,695	153,877	8,804
10,076	Chicago, Milwaukee & St. Paul.....	5,458,045	1,318,542	6,776,587	607,549	1,440,632	131,033	3,298,327	58,468	154,037	5,651,005	1,991,032	411,232	1,579,651	222,138
255	Chicago, Peoria & St. Louis.....	1,107,043	20,885	1,127,928	77,749	28,444	130,350	2,671,405	39,672	168,073	4,233,901	1,311,250	316,062	1,015,727	15,186
763	Chicago, Rock Island & Pacific.....	3,728,716	1,334,293	5,063,009	635,878	1,018,009	130,350	2,671,405	39,672	168,073	4,233,901	1,311,250	316,062	1,015,727	15,186
477	Chicago, Rock Island & Gulf.....	185,990	53,293	239,283	33,288	30,199	10,179	50,521	1,390	9,036	173,544	87,224	10,000	77,182	16,025
1,753	Chicago, St. Paul, Minn. & Omaha.....	1,042,527	375,186	1,417,713	112,344	201,901	29,612	698,820	14,706	40,248	1,097,206	428,561	81,692	346,788	32,671
373	Chicago, Terre Haute & S. E.....	225,019	15,965	240,984	17,056	48,917	4,473	85,435	1,518	8,713	166,110	79,926	10,417	69,508	28,321
622	Cincinnati, Hamilton & Dayton.....	544,986	86,045	631,031	113,552	150,686	13,822	259,632	2,885	19,187	557,124	142,910	33,829	108,915	206,373
332	Cincinnati, Indianapolis & Western.....	132,016	37,780	169,796	13,508	29,664	5,318	88,501	408	6,978	144,034	41,168	9,664	31,504	.....
337	Cincinnati, New Orleans & Texas Pacific.....	700,066	175,465	875,531	69,663	222,896	26,921	277,139	6,804	22,206	625,630	303,984	32,000	271,978	58,243
246	Cincinnati Northern.....	106,803	15,815	122,618	20,460	22,157	2,535	42,612	.....	2,747	90,513	39,760	6,000	33,758	32,073
2,385	Cleveland, Cincinnati, Chic. & St. Louis.....	2,493,987	694,630	3,188,617	322,824	686,633	77,468	1,305,120	23,729	76,379	2,488,965	993,928	135,000	855,890	501,201
338	Colorado Midland.....	100,248	8,129	108,377	13,929	30,268	6,552	52,292	726	5,227	108,994	10,227	6,800	3,427	4,114
1,102	Colorado & Southern.....	581,197	92,032	673,229	78,220	139,225	8,594	228,081	3,408	21,835	479,363	248,297	35,000	213,212	79,597
87	Cripple Creek & Colorado Springs.....	87,146	13,847	100,993	4,295	12,192	2,585	30,051	.....	3,454	52,577	50,349	4,393	45,956	.....
164	Cumberland Valley.....	227,966	50,608	278,574	28,279	21,753	4,487	92,815	1,103	8,038	153,688	138,778	5,960	132,818	69,400
886	Delaware & Hudson Co. R. R. Dept.....	1,931,116	205,208	2,136,324	188,266	336,483	24,382	726,859	12,029	65,456	1,352,598	867,404	24,058	863,347	414,987
985	Delaware, Lackawanna & Western.....	3,184,755	266,472	3,451,227	230,872	423,317	74,623	1,377,766	28,986	85,982	2,438,582	1,784,450	202,500	1,581,926	848,957
2,566	Denver & Rio Grande.....	1,346,555	256,819	1,603,374	122,262	336,358	37,844	540,439	21,538	58,117	1,117,677	607,470	92,000	515,679	149,721
255	Denver & Salt Lake.....	126,555	15,082	141,637	19,437	39,676	1,435	68,036	.....	4,681	133,265	14,704	7,005	7,699	.....
397	Detroit & Mackinac.....	55,305	22,897	78,202	28,279	21,753	4,487	92,815	1,103	8,038	153,688	138,778	5,960	132,818	69,400
81	Detroit & Toledo Shore Line.....	169,743	17,241	186,984	188,266	336,483	24,382	726,859	12,029	65,456	1,352,598	867,404	24,058	863,347	414,987
191	Detroit, Grand Haven & Milwaukee.....	150,000	229,126	379,126	21,994	41,604	5,099	149,456	610	4,167	222,929	6,197	3,770	2,426	3,538
441	Detroit, Toledo & Ironmont.....	148,637	11,204	159,841	17,463	25,941	4,399	47,577	.....	5,965	141,344	32,084	6,000	26,083	59,602
288	Duluth & Iron Range.....	56,266	20,184	76,450	39,856	53,643	1,260	69,878	1,728	7,167	173,532	85,865	4,275	90,140	35,838
399	Duluth, Missabe & Northern.....	73,914	22,665	96,579	68,251	93,712	3,083	80,093	1,141	3,862	255,142	144,934	6,086	151,020	81,544
630	Duluth, South Shore & Atlantic.....	182,568	55,243	237,811	35,346	33,890	7,778	111,305	3,245	12,814	205,379	51,845	19,000	32,793	19,013
187	Duluth, Winnipeg & Pacific.....	101,256	19,301	120,557	7,977	16,583	1,596	62,275	732	6,281	95,444	29,067	6,226	22,841	9,860
1,027	El Paso & Southwestern Co.....	632,310	143,728	776,038	94,066	123,439	20,703	226,386	6,179	26,039	496,813	329,835	37,329	292,381	48,626
790	Elgin, Joliet & Eastern.....	977,733	10,105,472	10,703,205	64,362	183,489	7,020	337,865	.....	17,882	612,464	442,008	41,700	400,308	277,372
1,988	Erie.....	3,921,156	673,938	5,119,712	418,597	1,154,751	87,835	2,079,476	33,502	132,435	3,906,013	1,211,698	194,147	1,018,994	305,466
745	Florida East Coast.....	52,104	216,085	268,189	38,084	66,164	13,943	182,015	3,732	20,579	243,888	111,521	25,438	218,452	115,676
454	Fort Worth & Denver City.....	330,514	112,962	443,476	46,084	79,279	6,292	144,065	12,421	16,512	304,654	166,271	15,217	151,054	67,176
1,351	Galveston, Harrisburg & San Antonio.....	664,236	210,959	875,195	184,313	181,793	32,467	414,936	10,896	34,284	855,312	51,184	48,502	32,671	3,518
13	Galveston Wharf.....	.....	.....	.....	128,429	1,861	337	38,873	27,891	384	71,712	56,717	10,000	46,717	47,267
307	Georgia.....	174,908	63,526	238,434	25,605	42,938	13,390	105,888	85	7,517	194,853	64,622	4,865	59,694	31,651
395	Georgia, Southern & Florida.....	120,866	64,022	184,888	23,836	35,416	7,467	81,314	.....	8,646	156,661	56,862	12,138	44,664	32,865
575	Grand Rapids & Indiana.....	295,705	104,159	400,864	55,047	85,539	10,574	192,944	604	16,171	361,238	68,844	23,929	44,833	22,419
347	Grand Trunk Western.....	525,000	117,000	642,000	57,603	109,746	15,260	288,370	5,080	14,329	490,389	198,928	32,970	165,914	166,608
8,102	Great Northern.....	3,305,041	864,363	4,701,363	452,202	700,547	90,146	1,887,590	67,552	109,623	3,305,408	1,395,958	381,984	1,013,408	217,981
308	Gulf & Ship Island.....	125,020	30,281	164,294	13,349	27,557	3,323	43,790	305	8,494	96,824	67,470	6,887	60,581	38,423
1,938	Gulf, Colorado & Santa Fe.....	951,572	222,363	1,173,935	205,699	188,029	29,128	526,595	.....	40,110	986,047	261,248	61,300	199,803	216,224
350	Hocking Valley.....	426,341	66,103	492,444	56,399	133,175	8,685	175,829	.....	13,722	387,809	132,022	43,200	88,737	15,833
191	Houston, East & West Texas.....	78,703	22,726	101,429	22,726	113,925	2,217	40,629	580	3,563	85,574	28,351	5,342	22,956	3,292
895	Houston & Texas Central.....	321,722	96,569	462,434	90,361	55,170	17,284	206,955	5,460	19,141	393,804	68,630	31,611	36,889	84,617
4,767	Illinois Central.....	4,135,093	1,107,035	5,600,659	633,435	1,371,119	97,890	1,914,175	32,295	143,658	4,200,309	1,459,760	323,000	1,133,886	4,840
110	Indiana Harbor Belt.....	522,866	146,297	669,163	31,844	33,575	2,876	54,767	.....	8,646	156,661	56,862	12,138	44,664	32,865
1,160	International & Great Northern.....	522,866	146,297	669,163	115,565	138,525	20,457	369,550	2,325	26,948	306,519	135,063	40,000	196,519	4,550
177	Kanawha & Michigan.....	237,439	27,429	264,868	40,531	68,347	2,843	80,085	1	6,988	196,776	52,409	13,715	78,85	

Traffic News

The Illinois Central has announced its intention of putting in service next fall a 23-hour passenger train between Chicago and New Orleans.

The Adams Express Company announces that it has secured a controlling interest in the Southern Express Company. The Adams has been a large owner in the stock of the Southern for many years.

The Great Lakes Transit Company, formed to buy the vessels of a number of railroad companies on the Great Lakes, and the organization of which was announced in the *Railway Age Gazette* February 25, page 370, has completed the purchase of 33 vessels; and contracts for freight are now being made.

The Public Service Commission of West Virginia has authorized the increase of demurrage charges on freight cars in that state from \$1 a day to \$2, the higher rate to be in effect until June 15. The New York State Public Service Commission, Second District, has issued a similar order, but extending the time to June 30.

The Missouri Pacific and St. Louis, Iron Mountain & Southern now run fast freight trains through to and from New Orleans and other stations on the Trans-Mississippi Terminal Railroad. They have a joint trackage contract with the Texas & Pacific applying between Alexandria, La., and Mile Post 9 on the Trans-Mississippi Terminal. The Iron Mountain owns a one-half interest in the Terminal.

The Spokane Merchants' Association has filed a petition with the Interstate Commerce Commission asking it to reopen the intermountain rate case in view of the fact that the Panama Canal is now closed and will be closed for some time, and that therefore one of the justifications for rates to the Pacific coast from the East lower than are allowed to the intermountain territory has been removed.

The Chicago & North Western, in co-operation with the Greater Des Moines Club, has arranged for a good roads special train to spend eight days touring the state of Iowa, starting at Des Moines and stopping at 22 cities and towns. The train is especially equipped for the purpose of interesting and instructing the people in the benefits and pleasures to be derived from good roads, and prominent lecturers have been secured to accompany the train.

The Baltimore, Chesapeake & Atlantic, running steamboats between Baltimore and numerous points on the Eastern shore of Chesapeake Bay, has its vessels still in service, the Interstate Commerce Commission, at the request of numerous protestants in Baltimore, having suspended its order by which the railroad company was required to divest itself of the ownership of most of the boats on April 1. It is expected that the commission will reopen the case and hold further hearings.

The Secretary of Agriculture announces that the long fight against the foot-and-mouth disease is over. He has issued an order removing all foot-and-mouth quarantines and restrictions against the shipment and movement of livestock. A small territory in Christian county, Ill., was the last area which was under suspicion. Dealers can now ship their cattle as before the first quarantine was imposed. Foreign governments which have placed embargoes on American cattle are expected to remove these embargoes. This disease had gained a temporary footing in 22 States and in 269 different counties.

Loans to Southern Students

The Southern Railway has given \$1,000 to each of nine State Agricultural Colleges as a memorial to the late President Finley, who has aided Southern agriculture in numerous and important ways. President Fairfax Harrison announces that these gifts are to go to the colleges in Virginia, North Carolina, South

Carolina, Georgia, Florida, Alabama, Mississippi, Kentucky and Tennessee, and they will be designated "Southern Railway Loan Fund: William Wilson Finley Foundation." Loans from the fund in each State are to be made by the college authorities to worthy students, subject only to the restriction that the recipients shall be from counties traversed by the lines of the Southern Railway or its associated companies. This permanent loan fund will take the place of the four-year Southern Railway scholarships provided by Mr. Finley, which will expire with the close of the present school year.

Low Rate Not to be Withdrawn While Panama Canal Is Closed

L. J. Spence, director of traffic of the Southern Pacific, has issued the following statement regarding the position of the company with reference to transcontinental freight rates:

"During the past year all the lines have joined in making reduced rates on a great many commodities from the East and Middle West, including iron and steel articles from producing points in Alabama and Pittsburgh territories, and have initiated unusually low rates to New York and other Atlantic ports upon a number of the most important products of California, including asphalt, barley, beans, canned fruit and vegetables, canned salmon, copper bullion, dried fruit and wine. Some of the transcontinental lines have made a persistent effort to accomplish the withdrawal or advance of these rates during the temporary suspension of steamship service through the Panama Canal, but from the outset the proposition has been discouraged by the Southern Pacific lines, which during the past week have definitely and finally refused to withdraw or advance any of these rates. This may be of special interest to California shippers and chambers of commerce who have recently supported, before the Interstate Commerce Commission, this company's application, made in pursuance of the provisions of the Panama Canal act, for permission to continue the ownership and operation of its steamship lines from Galveston and New Orleans to New York. Since February 1, 1883, these steamship lines have been operated as an extension of our rail lines from California to Galveston and New Orleans—these rail and steamship lines forming the "Sunset Route." The operation of this route from California to New York under a single ownership and management has not only given California merchants a service which has been characterized by its efficiency but has also made possible the establishment of the unusually low rates, to which I have referred, for the shipment of California's products to New York and other Atlantic ports.

"In supporting our recent petition the California shippers evidently appreciated that a separation of our steamships from our rail lines would make it impossible to continue the low rates that have been made or to establish others which are now awaiting the authority of the Interstate Commerce Commission, and they doubtless expected that the inauguration of these rates by the Sunset Route would give them a stability that is invaluable to the public during the temporary suspension of operations through the canal, and would not even be otherwise assured when the canal lines are in full operation, inasmuch as experience has shown that rates of the canal lines are subject to violent fluctuations. It may therefore gratify the California people to know that their confidence and support has been justified by our refusal to deprive them of these rates during the temporary suspension of canal service."

Freight Facilities in Manhattan

R. A. C. Smith, dock commissioner of New York City, criticizing the proposals of superficial students for improving the dock and track facilities of the West Side of Manhattan, has written a letter outlining some features of the problem to be dealt with, and supplementing the statement printed in the *Railway Age Gazette*, January 21, page 135. He says:

"It should be remembered that in all discussion of the proposed settlement with the New York Central, the Port and Terminal Committee of the Board of Estimate and Apportionment has been most careful to so adjust the railroad's right of way that it interferes at no point with any type of marginal street development which the future may show to be necessary or desirable.

"The chief object in forcing this company into a private right of way south of Thirtieth street was to keep the waterfront

under the city's control for future organization. North of Thirtieth street to Fifty-ninth street ample space has been left for additional city-owned tracks if that solution appear ultimately desirable for this section.

"The proposition to solve all the difficulties of the port by the simple expedient of constructing a line of railroad tracks back of all the city piers is inapplicable to the West Side of the Borough of Manhattan. A railroad is necessarily much more than the main running tracks. A railroad must have storage and classification yards, terminal stations and switching accommodations. The sole reason why the New York Central is able to continue its direct rail service to lower Manhattan is because of the enormous supporting yards between Fifty-ninth and Seventy-second streets. Careful estimates made by the engineering advisers of the city five years ago showed that to take care of the then business of the railroads it required approximately two thousand cars a day traveling in each direction. The requirements of today are greater, but even on the two thousand car estimate it would be equivalent to a solid train of sixteen miles.

"When to this is added the necessary terminal yards and receiving stations, it is perfectly obvious that a very large amount of real estate would be required to make the proposed marginal road a practical operating facility. Real estate in the Borough of Manhattan, particularly at the southern terminus of the proposed road, is enormously expensive, running frequently as high on assessed valuation as \$1,000,000 per block. It is unthinkable that it would be feasible as a practical proposition to pay anything like this figure for railroad yard space.

"There are great practical operating difficulties in connection with both the tunnel and float-bridge plans. Business custom and necessity require that practically the entire business shall move within two and three hours in the morning and the same time in the afternoon. This means that even under present conditions of traffic not less than two thousand cars must be passed in that period over the joint float-bridges proposed by Mr. Tomkins, or through a tunnel if that be provided. The west side waterfront of the Borough of Manhattan calls for a certain character of facilities, as for instance: Waterfront terminals for the New Jersey railroads; Southern and coastwise steamship service; Eastern steamship service; foreign express, passenger and package freight steamship lines.

"To fail to give to these facilities proper accommodations on the Hudson River waterfront would be to destroy the entire port of New York. This particular stretch, from Sixtieth street south, is perhaps the most intensively used stretch of waterfront in any port in the world. To provide piers of sufficient width to carry railroad tracks would be an enormous economic waste and would burden shippers and consumers with greatly increased charges. Our experience so far with many of the west side piers with track connections is that they are not used and are practically abandoned.

"Traffic conditions on the marginal way can be greatly improved, and I am about to submit plans for the rearrangement of this street and the readjustment of its use which will eliminate a great amount of the present chaos and congestion.

"I deplore the repeated attempts of superficial students of the situation to make it appear that the port of New York is less progressive than other ports. New York has done more in the past two years in the matter of its physical upbuilding than it has ever done in a similar period, and, both actually and relatively, more than any other port in the United States. Seven miles of new wharfage room, together with 45½ acres of new dock space, is a record of which the city may well be proud. . . ."

Coincident with the publication of Mr. Smith's letter it is announced that all the engineering details connected with the settlement between the city and the New York Central for the West Side improvements have been agreed on. The original agreement was reached on January 15, and the Committee on Port and Terminal Facilities is now about to file with the Board of Estimate a complete report on the solution of the problems involved, as well as on the real estate adjustments. Detailed plans will be offered for public discussion, and hearings will be held after the statutory thirty-day interval.

Controller William A. Prendergast says that it will be found that "the railroad occupancy of waterfront has been reduced and the lower section completely freed for joint terminal use

by other railroads." A beautiful park has been provided for along the Hudson, and railroad operation at grade has been done away with along the entire length of the line. The yard spaces have been adjusted to meet the needs of local communities, and important concessions have been obtained in the opening of city streets through the railroad yards. All these advantages, the controller points out, finally have been obtained without the expenditure of any capital by the city.

Eastern Freight Accumulation Conference

It is announced that excellent progress has already been made as a result of the organization of the Eastern Freight Accumulation Conference on March 17. Effective measures of relief have been adopted, considerable territory has been cleared to permit of more efficient handling of freight and information has been gathered which makes possible the placing or raising of embargoes upon a basis that meets the requirements of the whole situation rather than the interests of an individual road.

The sub-committee on freight accumulation has sent out 21 inspectors in New England and New York harbor territory. Through the efforts of this committee the situation in New England has been materially improved, and much of the New Haven territory opened up for freight which is held up on account of embargoes. A reduction in the total number of cars on the New Haven system was effected in less than three weeks to the extent of 11,260 cars; and incidentally this has resulted in a saving to the New Haven of \$5,067, daily, in per diem charges.

The inspectors sent into New England made exhaustive examinations into conditions at 42 places, and they suggested important improvements in methods of handling. A large number of the piers in New York harbor have been visited and studies made of conditions existing at them. The committee has been able to formulate some valuable recommendations from the investigation so far made at these piers.

The sub-committee on embargoes has been in daily session in New York considering hundreds of requests from shippers from all parts of the country. The New Haven embargo has been materially modified by this committee. The Erie embargo on grain has been raised to the extent of 150 cars a day, and the New York Central embargo on export grain has been raised, subject to acceptance by designated agent and upon satisfactory proof of ocean contract for vessel space. This committee has the whole situation at its fingers' ends, and as quickly as any particular section may be opened up, the order is issued. The embargo committee has the widest authority, and no embargo may be placed or raised on any road that would adversely affect the whole situation. Commissioner Clark is chairman of this committee.

The sub-committee on traffic has offered several resolutions which have been acted upon by the Conference. Tariffs have been revised, one revision providing that export bills of lading will only be issued when founded on written ocean contracts. Traffic moving under these bills of lading is allowed fifteen days' free time, after which regular storage charges will prevail. Hereafter freight consigned to New York harbor must be consigned to a specific destination. If reconsigned after delivery in New York harbor a charge of two dollars a car will be made.

At the last meeting of the Conference the traffic managers' committee of the Trunk Line Association was directed to arrange to modify existing tariffs so as to stop the practice of sending freight to the seaboard on domestic bills of lading, and upon arrival reconsigning it for export. This practice has been indulged in by many shippers to defeat the purpose of the embargoes.

The Conference has enjoyed the hearty co-operation of trade associations, shippers, consignees, and public service commissions. The Merchants' Association of New York and the Chamber of Commerce of Boston have been particularly helpful, and many of the relief measures adopted by the Conference have originated with those organizations. The Conference and the Merchants' Association are working in absolute harmony in their efforts to relieve the congested situation in New York harbor. The public service commissions of practically all states have approved the changes which have been made in tariffs. The Interstate Commerce Commission's approval of the increase in demurrage (for 2½ months) is noted below.

The members of the Conference "feel that a most healthy

progress has already been brought about, and that the outlook for the future is bright." It is expected that in the near future some of the inspectors in the New England district may be transferred to other roads.

In New York City the principal roads have agreed to keep their most crowded freight stations open for the delivery of inbound freight until 9 p. m. J. C. Lincoln, traffic manager of the Merchants' Association, has sent a letter to the merchants of the city explaining the reasonableness of the different changes made by the railroads to secure more prompt removal of freight from the freight houses. He also called on shippers to send outbound freight to the freight houses early in the day, where possible, and emphasized the need that every individual should do his part in removing delays, for the general good.

The president of the New York Dried Fruit Association issued a special bulletin calling upon members of the association to co-operate in relieving the congestion on the railroad piers and also on the docks of the Southern Pacific and other lines bringing California fruit to the port of New York by water from Texas.

The modifications of embargoes announced this week have relieved the pressure on the freight departments at Albany, N. Y., Mechanicsville, N. Y., and other points, as well as at New York. The New York Central accepts coal for points on the Boston & Maine; accepts all carload freight for the Boston & Albany, and accepts carload freight from points west of Buffalo for most of its connections at the Niagara frontier. Grain for Buffalo is accepted, except shipments for one elevator.

The Erie accepts carload freight for the Mallory, the Clyde, and other steamship lines at New York City when the freight can be delivered to the vessel without going by way of any Erie station in the city. The boat lines had complained that the railroad had wrongfully imposed embargoes on shipments for their vessels. The New York, Ontario & Western accepts grain, except corn, for export via New York, subject, however, to the approval of each shipment by the railroad company's agent at New York.

The New Haven road has lifted most of its embargoes on freight from northern and eastern points, but not on freight destined for steamships or lighterage at New York city. It refuses all freight consigned "to order, notify," and has cancelled embargoes on bleaching powder, soda ash, fertilizer material and certain other commodities.

At Boston this week the freight situation is reported as rapidly improving. The freight congestion committee of the Boston Chamber of Commerce took vigorous action and sent to all large receivers of freight a letter explaining the conditions at the railroad terminals in much detail. The number of cars of different classes standing in each of the important yards, the amount of delay, the causes of delay, the improvement or otherwise compared with last year, and other important facts were set forth so as to be comprehended by all. Faults of carriers and of consignees were very clearly stated; and it was plainly intimated that the request of Commissioner Clark for information as to delinquent consignees would be promptly complied with unless there should be an immediate improvement.

The New England Demurrage Commission, A. G. Thomason, commissioner, an organization in which the railroads and shippers co-operate, works in intimate co-operation with the Boston Chamber of Commerce, and also with the inspectors sent into New England by the Freight Accumulation Conference. The activities of the Demurrage Commission seem to have brought about a good degree of effective co-operation between railroads and merchants.

On the joint recommendation of the American Railway Association and the National Industrial Traffic League, the Interstate Commerce Commission allowed to go into effect on April 1, until June 15, an increase in the demurrage rate from \$1 to \$2 per car per day for detention after three days following the expiration of the free time, and also a modification of the average agreement by which credits for releasing cars within the free time can only be used to cancel debits to which the \$1 rate would apply, but not to detentions to which the \$2 rate would apply. This plan represents a compromise on the plan proposed by the American Railway Association. The joint recommendation was agreed to by the demurrage committee of the league only after the league had taken a referendum vote on the proposition, as reported in last week's issue.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Rating on Carburetors

Weinstock-Nichols Company et al. v. Cleveland, Cincinnati, Chicago & St. Louis. Opinion by the Commission:

The rating of one and one-half times first class on carburetors in less than carloads from Chicago and Indianapolis to San Francisco, Los Angeles, Portland and Seattle is found unreasonable and a first class rating is prescribed. (38 I. C. C. 288.)

Rates on Lumber to Memphis, Tenn.

Vandenboom-Stimson Lumber Company et al. v. St. Louis, Iron Mountain & Southern. Opinion by Commissioner Clements:

The commission finds that the application by the Chicago, Rock Island & Pacific of local rates on shipments of hardwood logs, and by the St. Louis, Iron Mountain & Southern of gross and net rates on hardwood bolts and logs from points of origin in Arkansas, Oklahoma and Louisiana to Memphis, which exceed by more than 1 cent per 100 lb. the rates for corresponding distances between points in Arkansas, or from points in Louisiana and Oklahoma to points in Arkansas, subjects interstate traffic therein involved to disadvantage in violation of section 3 of the act. Reparation awarded. (38 I. C. C. 432.)

Ocean-and-Rail Rates to Charlotte, N. C.

Opinion by Commissioner Clark:

The commission finds justified a proposed cancellation of the ocean-and-rail class and commodity rates from eastern port cities, interior eastern points and interior New England points via the Clyde Line to Charleston, S. C., to Charlotte, N. C., and those points in North and South Carolina lying between Rock Hill, S. C., and Charlotte, and between Blacksburg, S. C., and Charlotte, not including Blacksburg. Joint rates via Norfolk, Va., and via Wilmington, the same as the cancelled rates will still apply, and it was shown that the service over these routes is much better. (38 I. C. C., 405.)

Rates Between St. Louis and Ohio River Points

In re class and commodity rates between St. Louis and East St. Louis and Ohio river points, and between the Ohio river points themselves. Opinion by the commission:

The class and commodity rates of carriers operating both north and south of the Ohio river in the territory lying between St. Louis, Mo., and East St. Louis, Ill., on the one hand, and Ohio river points on the other, and between the various Ohio river points themselves, are in many instances in contravention of the long-and-short-haul rule of the fourth section of the act, and the carriers have asked to be allowed to continue these rates between the river points, which are lower than rates at intermediate points.

The commission holds that water competition justifies departures from the long-and-short-haul rule of the fourth section in rates between points on the Ohio and Mississippi rivers.

Authority to continue to charge class and commodity rates between the same points via Chicago and Chicago junctions lower than rates to intermediate points is denied.

Authority to continue class and commodity rates between the same points via the route of the Louisville & Nashville through Guthrie lower than rates to intermediate points is also denied. (38 I. C. C., 411.)

Free Storage Time

Commercial Exchange of Philadelphia v. Pennsylvania Railroad et al. Opinion by the commission:

Defendants' rule, in effect since November 15, 1914, limiting free storage time at Philadelphia to two days is held to have been justified and is not found discriminatory.

It is found, however, that defendants' tariffs are unreasonable in that they fail to contain a rule providing additional free

storage time on account of bunching of cars by carriers. "Defendants' demurrage rules contain a provision for additional free time on account of the bunching of cars by carriers, but not their storage rules. The system employed in the handling of carload shipments through the terminal warehouses in lieu of storage on carriers' tracks or in their freight stations, and the peculiar circumstances governing at Philadelphia, indicate no reason why a bunching rule should there be applied in connection with free demurrage time, but not in connection with free storage time. The facts appearing suggest in this case no difference in principle underlying free demurrage time and free storage time with respect to the application of a bunching rule, but we are not to be understood as reaching a conclusion to this effect for general application." (38 I. C. C., 320.)

Baltimore Chamber of Commerce v. Baltimore & Ohio et al. Opinion by Commissioner Harlan:

Following *Commercial Exchange of Philadelphia v. P. R. R. Co.* (38 I. C. C., 320) a reduction from four days to two days in the period of free storage in warehouses on carload shipments of flour, feed, hay and straw received at Baltimore, Md., is found to have been justified.

Although not put in issue by the complaint, conditions are shown to be substantially the same as at Philadelphia, and indicate the propriety of a provision in storage rules for the bunching of cars. (38 I. C. C. 326.)

Complaint Dismissed

Lamb-Fish Lumber Company v. Yazoo & Mississippi Valley et al. Opinion by the commission:

Defendants' rates on lumber in carloads from Charleston, Miss., to Mobile, Ala., and Pensacola, Fla., for export are not found unreasonable or discriminatory. (38 I. C. C., 278.)

McCaull-Dinsmore Company v. Great Northern et al. Opinion by the commission:

Charges collected on a carload of shelled corn from Sioux Center, Ia., to St. Joseph, Mo., are not found illegal. A fourth section application filed by the Chicago, Burlington & Quincy, seeking authority to continue rates on shelled corn from St. Paul, Minn., to St. Joseph, Mo., lower than the rates from Sioux City and other intermediate points, is denied. (38 I. C. C., 297.)

Second Industrial Railways Case

Westport Stone Company and Big Four Stone Company. Opinion by Commissioner Meyer:

The Westport Stone Company at Westport, Ind., and the Big Four Stone Company, at Newpoint, Ind., each receive an allowance of \$1 a car from the Cleveland, Cincinnati, Chicago & St. Louis for switching cars between the junction of their lines and the Big Four and their respective quarries. It appeared that the engines of the road-haul carrier were not adapted to operation over the sharp curves of the industry tracks and the switching services referred to were from the outset performed by the industry's engine, not only to and from the junction point of the plant tracks and railroad spur, but beyond to the main track of the Big Four.

The commission holds that no obligation has been shown to rest upon the Big Four to switch cars beyond the junction points of the tracks of the respective stone companies and the spurs maintained by the Big Four.

Commissioner Harlan dissents. (38 I. C. C., 316.)

Rates on Soda Ash

Oklahoma Traffic Association v. Atchison, Topeka & Santa Fe et al. Opinion by the commission:

The commission finds that the rate on soda ash in carloads from Hutchinson, Kan., to Oklahoma City, Okla., is unreasonable to the extent that it exceeds 17 cents per 100 lb.; that the rates on soda ash, caustic soda, and silicate of soda in carloads from St. Louis to Oklahoma City, are unreasonable to the extent that they exceed 21 cents per 100 lb. on soda ash and 35 cents per 100 lb. on caustic soda and silicate of soda, respectively, and that the through rates on the commodities involved from Chicago, Detroit and Wyandotte, Mich.; Solvay, N. Y.; Grasselli and Fortville, Ind., and certain other points east of the Mississippi river are unreasonable to the extent that they exceed rates made by the use of locals or differentials, as

the case may be, to St. Louis, plus the rates beyond, herein found reasonable. It also holds that the assessment of charges on mixed carloads of soda ash and caustic soda, from the points involved to Oklahoma City, higher than the charges assessable on the basis of the highest carload rate and minimum weight applicable to either commodity is unreasonable. (38 I. C. C., 392.)

STATE COMMISSIONS

The Public Service Commission of West Virginia has ordered the Chesapeake & Ohio to run a sleeping car regularly between Charleston and Huntington for the accommodation of passengers between Charleston and Wheeling, the car being run between Huntington and Wheeling over the Baltimore & Ohio. This order, to go into effect April 15, calls for the restoration of a run which was discontinued some months since.

COURT NEWS

In the United States District Court at Trenton, N. J., March 31, a fine of \$100,000 was imposed on the Lehigh Coal & Navigation Company for accepting rebates from the Central of New Jersey. This suit is based on the same transactions as those on which the railroad company was fined \$200,000 a number of months ago.

A special United States district court at San Francisco on March 27 issued an order enjoining an order of the Interstate Commerce Commission, which held that the cities of Sacramento, San Jose, Stockton and Santa Clara, Cal., were not entitled to terminal rates on westbound transcontinental freight. The injunction was asked by the boards of trade of the cities mentioned, and the case was defended by the Interstate Commerce Commission and the Department of Justice. An appeal is to be taken to the Supreme Court of the United States.

Distance Within Which Train Can Be Stopped

In an action for the value of colts struck by a freight train consisting of 16 cars not heavily loaded, and going at about 30 miles an hour, the evidence showed a reasonable effort to stop the train. The engineer testified as to braking power, but said it was very variable. The trial court held as a matter of law that the train could have been stopped within 600 or 650 feet. An appeal to the Washington Supreme Court held this to be error, there being no positive testimony to sustain it.—Benn v. C. M. & St. P. (Wash.), 154 Pac., 1,082.

Service Letter Mentioning Labor Agitation Not Libelous

The Oklahoma Supreme Court holds that the following service letter, issued by a railroad company to its former employee upon his discharge is not libelous per se: "To Whom It May Concern: This is to certify that Mr. H. N. Medley has been employed . . . as car repairer from July 25, 1909, to January 17, 1910, when he was discharged for being an agitator and creating trouble in the ranks of our car men at Enid. Service unsatisfactory on this account." The letter did not impeach the plaintiff's skill or ability as a car repairer, nor impute any fraud, dishonesty, misconduct or incapacity in his trade. It did not subject him to public hatred, contempt, ridicule or obloquy, or deprive him of public confidence.—Rock Island v. Medley (Okla.), 155 Pac. 211.

Accident to Brakeman in Private Yards

In an action by a brakeman against the railroad and a coal company for injuries received by being crushed between the side of a coal car and an unlighted post in the private yards of the coal company, the Massachusetts Supreme Court holds that a railroad company is not bound to exercise a higher degree of care in the management of its trains on the premises of another corporation than on its own. Therefore, it need not point out to its employees obstructions in the yards of a third person in which switching is being done, for conditions may vary from day to day. The coal company constructed its own tracks, and cars were switched on them by the railroad. The coal company was held to owe the railroad employees the duty it would owe to servants of an independent contractor, who take the premises

and appliances, as regards obvious obstructions, as they find them. The coal company assumed the duty of keeping its yards lighted at night during switching operations, and had a special employee to see that the lights were lit. Proof that it failed to keep going lights close to the post was held evidence of negligence. The jury was entitled to find that the brakeman, who had just boarded the car, was in the exercise of due care, though he was riding on the side of the car. The coal company was held liable and the railroad not liable.—*Cross v. B. & M. (Mass.)*, 111 N. E. 676.

Free Passes—Secretary to Governor of New Jersey

The New Jersey Supreme Court holds that the secretary to the governor of that state is one of the state officers designated in the act of 1914 that the legislature can constitutionally require to be carried free upon the railroads of the state, according to the test laid down in *Delaware, Lackawanna & Western v. Board of Public Utilities Commissioners* (1913), 85 N. J. Law, 28, 88 Atl. 849. In that case it was held that the duty sought to be imposed on the company by the similar act of 1911 to carry free of charge the members of the State Water Commission was not an exercise of the reserved right of the legislature or of the police power, but constituted a taking of the companies' property without due process of law. Mr. Justice Garrison then pointed out, as the ground of that decision, the harm that was done by the issue of complimentary passes by railroad companies because of the impression produced on the public mind that public officers were placed under an obligation, or a suspicion of obligation, to corporations whose affairs in their relation to the public were constantly calling for official action. In the present case it is held that because the good will of such an officer as the secretary to the governor "might well be deemed advantageous to the railroads, and his ill will something to be deprecated," it followed that he was "within the class of state officials that the legislature in the exercise of its reserved power, and as a matter of public policy, was constitutionally entitled to require should be carried free."—*Pennsylvania v. Herrmann (N. J.)*, 96 Atl. 665.

Wisconsin Statute Regulating Terminal Charges Held Invalid

In an action for demurrage charges accruing on both local and interstate shipments, the Wisconsin Supreme Court holds that the Wisconsin act of 1915 providing that where common carriers move carload freight at an average rate of less than 75 miles per 24 hours the consignee shall be allowed additional free time for unloading, without demurrage, etc., is invalid, so far as affecting interstate commerce, as conflicting, in view of the demurrage rules of the American Railway Association, approved by the Interstate Commerce Commission Bulletin of June 3, 1913, with the Interstate Commerce Act. That act provides that the term "transportation" shall include all services in connection with the receipt, delivery and handling of property transmitted, and requires the carrier to establish and enforce reasonable regulations regarding the delivery of property. It also makes such regulations, filed with the Commission, lawful until set aside. "Terminal charges" required to be filed by the federal act, include "demurrage charges," which thus are not within state jurisdiction. The act was also held invalid as to intrastate commerce, since the interrelation of state and interstate freight forbids the inference of legislative intention that the interstate commerce act might operate only in part.

"From the viewpoint of the economist," the court said, "this statute is quite absurd. Delay in the transmission of freight cars, which is an evil injuriously affecting the shipper, the consignee and the public, is to be corrected by retaliatory delay. Public interest demands that cars be actively engaged and readily obtainable, and that the carrier be not required to purchase and use a number of cars disproportionate to the business done by it; for that must ultimately result in advanced rates of carriage on account of greater capital investment. Similar to this statute, only more obvious in its absurdity, would be a law to the effect that if one killed my cow I might kill one of his. Such a law might have some tendency to prevent him from killing my cow, but the net result would be that the collective wealth is diminished by the value of two cows. There are more effective and less wasteful modes of correcting the evil."—*Chicago, Milwaukee & St. Paul v. Rock County Sugar Co. (Wis.)*, 156, N. W. 607.

Railway Officers

Executive, Financial, Legal and Accounting

Davis S. Jones, chief clerk in the president's office of the Buffalo, Rochester & Pittsburgh, at Rochester, N. Y., has been promoted to assistant to the president, with headquarters at Rochester.

Operating

R. Doyle, trainmaster of the St. Francois County, has been promoted to superintendent, with office at Bonne Terre, Mo.

A. B. Raine has been appointed assistant general manager of the Tennessee, Alabama & Georgia, with office at Chattanooga, Tenn.

C. A. Cotterell has been appointed superintendent of the second district of the Canadian Pacific, with headquarters at Lethbridge, Alta., effective April 1.

J. D. McMillan has been appointed acting superintendent of the Belleville division of the Grand Trunk, with office at Belleville, Ont., vice H. F. Coyle, granted leave of absence on account of illness.

Major Charles Hine, special representative of the president of the Baltimore & Ohio, has been given a leave of absence for three months and has been appointed special representative of Jacob M. Dickinson, receiver of the Chicago, Rock Island & Pacific, with office in Chicago.

Frank Cone, superintendent of the Beardstown division of the Chicago, Burlington & Quincy, has been appointed superintendent of the Sheridan division with office at Sheridan, Wyo., vice G. L. Griggs. Mr. Griggs has been appointed superintendent of the Wymore division with headquarters at Wymore, Neb., vice L. B. Lyman, transferred. Effective April 1.

W. M. Whitemont has been appointed general manager of the Trans-Mississippi Terminal Railroad, with headquarters at New Orleans, La. The Trans-Mississippi Terminal Railroad has taken over all property of the Texas & Pacific and the St. Louis Iron Mountain & Southern in New Orleans. Westwego, Harvey and Gretna, including the new freight and passenger station and yards recently constructed, and will manage all of the business of these railroads in this terminal.

C. R. Morrill, superintendent of the second division of the Houston & Texas Central, Sunset-Central Lines, has been transferred to Houston, Tex., as superintendent of the Galveston division of the Texas & New Orleans and the Galveston, Harrisburg & San Antonio, vice F. B. Irvine. R. J. Barry has been appointed superintendent of the second division of the Houston & Texas Central at Austin, Tex., vice Mr. Morrill. J. F. Sugrue has been appointed superintendent of Morgan's Louisiana & Texas, the Louisiana Western and the Iberia & Vermilion, at Lafayette, La., vice J. W. Knightlinger, resigned. L. H. Cecil has been appointed superintendent of the Lake Charles & Northern with office at New Orleans, La., vice J. F. Sugrue, promoted. Effective April 1.

R. Boone Abbott, who was recently appointed superintendent of the Shamokin division of the Philadelphia & Reading, at Tamaqua, Pa., has since been appointed superintendent of the Harrisburg division, with office at Harrisburg, vice R. J. Stackhouse assigned to other duties. Mr. Abbott was born on July 14, 1881, at Philadelphia, and was educated in the public schools. He began railway work on October 1, 1900, with the Philadelphia & Reading, and in December of the same year was appointed assistant supervisor at Tamaqua. He was transferred in 1905 as assistant supervisor first to Reading, and two months later to Harrisburg. On June 6, 1905, he was appointed supervisor at Allentown, Pa., and later served in the same capacity at Olney, Philadelphia and at Pottsville, Pa. In March, 1910, he was appointed division engineer at Harrisburg, Pa., which position he held until March 17, 1916, when he was appointed superintendent of the Shamokin division, and on March 28 he was appointed su-

perintendent of the Harrisburg division, with office at Harrisburg, of the same road. Mr. Abbott is now president of the Engineers' Society of Pennsylvania.

E. H. Ziegler, superintendent of the Cairo division of the Cleveland, Cincinnati, Chicago & St. Louis, has been appointed superintendent of the Michigan division, with office at Wabash, Ind., vice P. T. White. E. F. Hayes, superintendent of terminals with office at Cleveland, Ohio, has been appointed superintendent of the Cairo division with office at Mt. Carmel, Ill., vice Mr. Ziegler. J. D. Bell has been appointed superintendent of terminals with headquarters at Cleveland, vice E. F. Hayes. R. H. Allison has been appointed trainmaster on the Cleveland-Indianapolis division with headquarters at Galion, Ohio. M. F. Gibson has been appointed trainmaster of the Peoria & Eastern with headquarters at Urbana, Ill. George W. Sears has been appointed trainmaster on the Cairo division with headquarters at Lyons, Ill., and Charles E. Burrows has been made trainmaster on the same division with headquarters at Harrisburg, Ill. Effective April 1.

Percy T. Litchfield, who has been appointed superintendent of the New London division of the New York, New Haven & Hartford, with headquarters at New London, Conn., as has been announced in these columns, was born on December 18, 1872, at Norwell, Mass., and was educated in the public schools. He began railway work on August 1, 1888, on the Old Colony Railroad, and served in the passenger department until June 1, 1893, when he became clerk in the superintendent's office of the same road. He subsequently served as chief clerk to superintendent of its successor, the New York, New Haven & Hartford at Hyannis, Mass., and at Boston, Mass., until February, 1907, when he was appointed assistant superintendent. One year later, on account of reorganization, he became chief clerk to the superintendent at Providence, R. I. In December, 1910, he was appointed acting trainmaster, and later served as assistant trainmaster at Providence. On December 8, 1912, he was appointed trainmaster, which position he held at the time of his recent appointment as superintendent of the New London division of the same road, as above noted.

James Elihu Turk, whose appointment as general superintendent of the Philadelphia & Reading, with office at Reading, Pa., has already been announced in these columns, was born at Watkins, N. Y., and began railway work in 1875 in a civil engineer corps, and in 1879 was appointed roadmaster. From 1880 to 1881 he served in the freight department of the Atchison, Topeka & Santa Fe at Las Vegas, N. M., and then to 1883, was chief engineer of the Valley Railway at Cleveland, Ohio. From 1883 to 1885, he was superintendent of the same road, and then to 1886 was engaged in railroad contracting on the Chicago, Burlington & Quincy, and the Chicago, Rock Island & Pacific in Illinois and Nebraska. In 1886 he was appointed principal assistant engineer in charge of construction on the Chesapeake & Ohio, Covington, Ky., to Ashland, remaining in that position until 1889, when he entered the service of the Philadelphia & Reading as supervisor of tracks and buildings. From 1899 to 1901 he was division engineer of the Reading division of the same road at Reading, Pa. In 1901 he was appointed superintendent of the Wilmington & Columbia division. Two years later he became superintendent of the Shamokin division, which position he held at the time of his recent appointment as general superintendent of the same road, as above noted.

Traffic

C. M. Swan, assistant general freight and passenger agent of the St. Francois County, has been promoted to general freight and passenger agent.

M. J. McMahon, general freight and passenger agent of the New Orleans Great Northern at New Orleans, La., has been promoted to traffic manager, with office at the same city. Effective April 1.

C. D. Boyd, general freight agent of the Atlanta-Cincinnati line of the Louisville & Nashville, at Knoxville, Tenn., has been appointed general coal and coke agent, with headquarters at Louisville, Ky., with jurisdiction over the entire line, and his former position has been discontinued; W. C. Gilbert has been appointed division freight agent at Knoxville.

H. L. Hudson, district freight and passenger agent of the Union Pacific System at Seattle, Wash., has been promoted to

assistant general freight and passenger agent, with headquarters at the same city.

H. F. Bohr, general freight and passenger agent of the Tennessee, Alabama & Georgia, has been appointed traffic manager, with office at Chattanooga, Tenn., and the office of general freight and passenger agent has been abolished.

A. C. Wilson has been appointed general agent, passenger department, of the Denver & Rio Grande, with office at Colorado Springs, Col., and E. D. Morrison has been made commercial freight agent, with office at the same city.

W. J. Doyle, city passenger and ticket agent of the St. Louis, Brownsville & Mexico at Corpus Christi, Tex., has been appointed general freight and passenger agent, with office at Kingsville, Tex., vice J. W. Jacobs, transferred.

C. E. Carlton, commercial agent of the Ft. Worth & Denver City at Houston, Tex., has been appointed general agent of the Gulf Coast Lines, with office at Chicago, Ill. V. E. Jackson has been appointed commercial agent of the Ft. Worth & Denver City at Houston, to succeed Mr. Carlton.

C. A. Russell, commercial agent of the Southern Railway at Memphis, Tenn., has been appointed district freight agent at New Orleans, La., vice M. M. Emmert, resigned to accept service with another company. J. B. Garvey, freight soliciting agent at New Orleans, has been appointed commercial agent, with office at the same place.

George W. French has been appointed commercial agent of the New York Central Fast Freight Lines, with headquarters at Indianapolis, Ind., vice A. K. Helton, resigned; Thomas C. Porteous, commercial agent at Spokane, Wash., has been appointed commercial agent at Los Angeles, Cal., vice F. R. Sullivan, promoted, and Leroy Blue has been appointed commercial agent at Spokane, Wash., vice Mr. Porteous, transferred.

Thomas E. Sands, general freight agent of the Minneapolis, St. Paul & Sault Ste. Marie at Minneapolis, Minn., has been promoted to freight traffic manager, with headquarters at the same city. Edward G. Clark, assistant general freight agent, at Minneapolis, has been appointed general freight agent, with office at the same place. C. V. Gallagher, general agent of the freight department at Chicago, Ill., has been promoted to assistant general freight agent, with office at the same city. Effective April 1.

Engineering and Rolling Stock

H. E. Bennett has been appointed superintendent of shops of the Chicago, Terre Haute & Southeastern, at Bedford, Ind.

Austin Grimes has resumed service as roadmaster of the Northern Pacific at Little Falls, Minn., vice Lee Barnes, transferred.

M. D. Franey, master mechanic of the New York Central at Elkhart, Ind., has resigned to take a position with the American Brake Shoe & Foundry Company at Erie, Pa.

W. J. O'Neill, master mechanic of the Chicago, Rock Island & Pacific, at Shawnee, Okla., has been appointed mechanical superintendent of the Second district, with office at El Reno, Okla., vice R. L. Stewart, deceased.

J. T. Flavin, master mechanic of the Chicago, Indiana & Southern at Gibson, Ind., has been appointed master mechanic of the New York Central at Elkhart, Ind., succeeding M. D. Franey, resigned, effective April 1. He will have charge of the entire fourth district.

Thomas Challoner, roadmaster of the Northern Pacific at Jamestown, N. D., has been appointed general roadmaster, with headquarters at the same place. William M. McDiarmid, branch line roadmaster, has been appointed main line roadmaster, with office at Jamestown. George Cottingham, Jr., has been appointed branch line roadmaster, with office at Carrington, N. D.

J. Karibo, master mechanic of the Cleveland, Cincinnati, Chicago & St. Louis, at Mattoon, Ill., has been promoted to superintendent of the general repair shops at Beech Grove, Ind. J. Butler, general foreman of the machine shops at Beech Grove, has been promoted to master mechanic at Bellefontaine, Ohio. E. J. Buckbee, general foreman of the Mt. Carmel (Ill.) shops, has been appointed master mechanic at Mattoon, vice Mr.

Karibo. Z. A. Baird has been appointed general foreman at Mt. Carmel, Ill., vice Mr. Buckbee.

Lewis Ketcham Sillcox has been appointed mechanical engineer of the Illinois Central in charge of car work. Mr. Sillcox was born April 30, 1886, at Germantown, Pa., and was educated at Trinity School, New York, and the Mechanical and Electrical Institute of Brussels. He entered the High Bridge shops of the New York Central as an apprentice in 1903, leaving there in 1906 to go to the McSherry Manufacturing Company, at Middletown, Ohio. In 1909 he resigned from that company as assistant shop superintendent. He was then made shop engineer of the Canadian Car & Foundry Company at Montreal, leaving in 1912 to become mechanical engineer of the Canadian Northern, which position he resigned to go with the Illinois Central.

OBITUARY

J. N. Bailey, auditor of the Paris & Great Northern, with office at Paris, Tex., was buried at St. Louis, Mo., on March 28.

W. C. Parker, division freight and passenger agent of the Chicago, Milwaukee & St. Paul at Cedar Rapids, Ia., died on March 13, at Chicago, Ill.

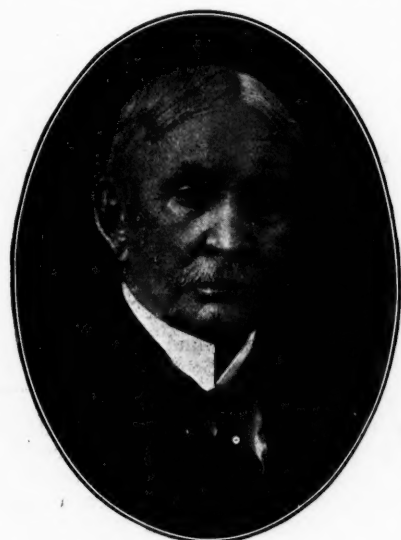
H. W. Ballou, superintendent of terminals of the Wabash at Chicago, Ill., until September, 1915, when he was granted a leave of absence on account of ill health, died on April 1, at Moberly, Mo.

H. J. Schmiel, formerly for a number of years auditor and assistant traffic manager of the Kalamazoo, Lake Shore & Chicago at Kalamazoo, Mich., previous to 1914, when he resigned on account of ill health, died on March 29, at the age of 51.

William Edwin Hoyt, special engineer of the New York Central Lines east of Buffalo, died on April 2 at his home in Rochester, N. Y. Mr. Hoyt was born in July, 1845, at Portland, N. H., and served as chief engineer of the Buffalo, Rochester & Pittsburgh from March, 1881, to February, 1900. He was then for seven years assistant engineer on the New York Central, and since July, 1907, was special engineer on the same road.

Elisha C. Field, vice-president of the Chicago, Indianapolis & Louisville, died at his home in Chicago on April 2. He was born near Valparaiso, Ind., on April 9, 1842. He attended common schools at Chicago, and later Pierce Institute, and the Valparaiso Male and Female College, now Valparaiso University. He attended that school about four years. In the fall of 1863

he entered the University of Michigan, from which he was graduated with the degree of LL.B. in March, 1865. After being admitted to the bar he began practice at Crown Point, Ind., in April, 1865. In 1866 he was elected district attorney of the ninth judicial district, and later was elected to the Indiana legislature in 1868. In 1879 he was elected judge of the thirty-first judicial circuit; he was



E. C. Field

re-elected in 1884, and served as circuit judge until 1889, when he resigned from the bench to become general solicitor of the Louisville, New Albany & Chicago. He continued in the same capacity when the road was re-organized as the Chicago, Indianapolis & Louisville. He was elected a director in 1905 and vice-president in 1907, which position he held until his death. In 1888 he was a delegate to the national convention in Chicago, which nominated Benjamin Harrison. In 1904 he was a presidential elector.

Equipment and Supplies

LOCOMOTIVES

THE WABASH is inquiring for 25 Santa Fe type locomotives.

THE MINNESOTA TRANSFER RAILWAY is contemplating the purchase of 4 switching locomotives.

THE ST. LOUIS SOUTHWESTERN has ordered 20 locomotives from the Baldwin Locomotive Works.

THE TUSCARORA VALLEY has ordered one American type locomotive from the Baldwin Locomotive Works.

THE TENNESSEE, ALABAMA & GEORGIA has ordered 2 ten-wheel locomotives from the Baldwin Locomotive Works.

THE CHICAGO GREAT WESTERN has ordered 3 Pacific and 7 Santa Fe type locomotives from the Baldwin Locomotive Works.

THE LA BELLE IRON WORKS, Steubenville, Ohio, has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

THE STANDARD OIL COMPANY, Bay Way, N. J., has ordered one four-wheel switching locomotive from the Baldwin Locomotive Works.

THE MICHIGAN ALKALI COMPANY, Wyandotte, Mich., has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

THE FLAGSTAFF LUMBER MANUFACTURING COMPANY, Flagstaff, Ariz., has ordered one Consolidation locomotive from the Baldwin Locomotive Works.

THE ST. LOUIS & SAN FRANCISCO, reported in last week's issue as contemplating the purchase of a number of Pacific type locomotives, has ordered 10 Pacific type locomotives from the Baldwin Locomotive Works.

THE PHILADELPHIA & READING, reported in the *Railway Age Gazette* of March 24 as being in the market for 25 locomotives, has ordered 26 Mikado and 6 Mallet type locomotives from the Baldwin Locomotive Works.

THE MINNEAPOLIS & ST. LOUIS was reported in last week's issue as having ordered 6 six-wheel switching locomotives from the American Locomotive Company. The number should have been given as 10 locomotives. These engines will have 21 by 28 in. cylinders, 57 in. driving wheels and a total weight in working order of 169,000 lb.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE was reported in last week's issue as having ordered 3 Santa Fe and 3 Pacific type locomotives from the American Locomotive Company. The Santa Fe type locomotives will have 28 by 30 in. cylinders, 57 in. driving wheels and a total weight in working order of 350,000 lb. The Pacific type locomotives will have 26 by 28 in. cylinders, 73 in. driving wheels and a total weight in working order of 290,000 lb. All 6 locomotives will be equipped with superheaters.

FREIGHT CARS

THE RAY & GILA VALLEY is in the market for 20 freight cars.

THE COAL & COKE has issued inquiries for 150 to 200 hopper cars.

THE CUDAHY PACKING COMPANY has ordered 100 center constructions.

THE KANAWHA & WEST VIRGINIA has placed an order for 50 underframes.

THE IMPERIAL OIL COMPANY, Sarnia, Ont., is in the market for 50 to 100 tank cars.

THE ST. LOUIS SOUTHWESTERN is reported as about to enter the market for freight cars.

THE GOODMAN LUMBER COMPANY, Goodman, Wis., has placed an order for 20 flat cars.

THE CLARK CAR COMPANY, Pittsburgh, Pa., has issued inquiries for 20 freight cars.

THE AMERICAN ROLLING MILLS COMPANY, Middletown, Ohio, is inquiring for 10 gondola cars.

THE ATLANTIC COAST LINE has ordered 25 Hart convertible cars from the Rodger Ballast Car Company.

THE PITTSBURGH, SHAWMUT & NORTHERN has ordered 200 underframes from the Ralston Steel Car Company.

THE PITTSBURGH & SHAWMUT has ordered 250 50-ton hopper cars from the American Car & Foundry Company.

THE FEDERAL DYESTUFFS & CHEMICAL COMPANY, 30 Pine Street, New York, is in the market for 30 tank cars.

THE GREAT NORTHERN has withdrawn the inquiry for 12 tank cars mentioned in the *Railway Age Gazette* of February 25.

THE ILLINOIS CENTRAL has withdrawn its inquiry for 300 steel frame stock cars and is preparing specifications for 300 all-wood stock cars.

THE CHICAGO & NORTH WESTERN has withdrawn its inquiry for 2,000 wooden box cars, mentioned in the *Railway Age Gazette* of March 17.

THE CHICAGO, BURLINGTON & QUINCY has withdrawn its inquiry for wooden box cars with steel center sills, mentioned in last week's issue.

THE SOLVAY PROCESS COMPANY, Syracuse, N. Y., which recently issued inquiries for 75 hopper cars, has ordered 20 such cars from the Pressed Steel Car Company.

THE WABASH, reported in last week's issue as being in the market for 1,000 box car bodies, has ordered these car bodies from the American Car & Foundry Company, and has issued inquiries for an additional 1,000 box cars.

THE CINCINNATI, NEW ORLEANS & TEXAS PACIFIC, reported in the *Railway Age Gazette* of March 24 as contemplating the purchase of 300 to 500 center constructions, has ordered 300 underframes from the Western Steel Car & Foundry Company.

THE NEW YORK, NEW HAVEN & HARTFORD, reported in the *Railway Age Gazette* of November 12 as being in the market for 20 milk cars, recently placed an order for 25 milk cars with the Osgood Bradley Car Company. The company will soon place an order also for 50 refrigerator cars.

PASSENGER CARS

THE SEABOARD AIR LINE has issued inquiries for 6 dining cars.

THE GREAT NORTHERN has withdrawn its inquiry for 10 baggage and mail and 15 baggage cars, mentioned in the *Railway Age Gazette* of February 25.

IRON AND STEEL

THE FLORIDA EAST COAST is receiving bids on rails.

THE SOUTHERN RAILWAY is in the market for rails.

THE NORFOLK & WESTERN is in the market for rails.

THE CHESAPEAKE & OHIO will place orders soon for a quantity of rails.

THE GRAND TRUNK has ordered 4,000 tons of rails from the Lackawanna Steel Company.

THE LEHIGH & NEW ENGLAND has ordered 3,000 tons of rails from the Bethlehem Steel Company.

THE LOUISVILLE & NASHVILLE has ordered 40 tons of plates from the Pennsylvania Steel Company.

THE MINNEAPOLIS & ST. LOUIS has ordered 8 deck spans, 222 tons, from the Pennsylvania Steel Company.

THE SOUTH AFRICAN RAILWAYS have ordered 12,000 tons of rails from the Algoma Steel Corporation, Ltd.

THE SOUTHERN PACIFIC will close soon with the Tennessee Coal, Iron & Railroad Company for 45,000 to 50,000 tons of rails.

THE KANSAS CITY SOUTHERN's order for 6,000 tons of rails mentioned in the issue of March 10 was placed with the Pennsylvania Steel Company.

THE WABASH has divided an order for 15,000 tons of 90-lb. rails between the Illinois Steel Company and the Lackawanna Steel Company.

THE BOSTON & ALBANY has divided an order for 120 tons of bridge steel between the American Bridge Company and the Pennsylvania Steel Company.

THE ATCHISON, TOPEKA & SANTA FE has reserved 50,000 to 60,000 tons of rails for 1917 delivery with the Colorado Fuel & Iron Company, and 10,000 to 15,000 tons with the Illinois Steel Company.

THE PENNSYLVANIA RAILROAD. The contract for 15,000 tons of steel for the hotel to be built for the Pennsylvania Railroad opposite its station in New York will be given, it is understood, to the American Bridge Company.

THE BALTIMORE & OHIO was noted in last week's issue as having ordered 50,000 tons of rails from the Carnegie Steel Company, 15,000 tons from the Maryland Steel Company and 10,000 tons from another company. This division was incorrect and should have been given as follows: Cambria Steel Company, 15,000 tons; Carnegie Steel Company, 35,000 tons; Maryland Steel Company, 10,000 tons and Illinois Steel Company, 15,000 tons.

UNITED STATES STEEL CORPORATION.—E. H. Gary, chairman of the steel corporation on April 5, issued the following brief statement in response to numerous inquiries about the rail situation: "The subsidiary companies of the United States Steel Corporation who manufacture rails have decided to maintain the present prices until May 1, 1916, as to rails sold for delivery up to May 1, 1917, but will make no commitments beyond that date."

MISCELLANEOUS

NEW YORK, NEW HAVEN AND HARTFORD.—The timber which will be used in the erection of the new bridge to be built by Holbrook, Cabot and Rollins Corporation over the Thames at New London, Conn., amounting to about 4,000,000 ft., has been ordered through J. L. Philips & Co., 32 Broadway, New York, representing large yellow pine manufacturers in the South.

RAILROAD TIES IN FRANCE.—There are 25,471 miles of railroad in France, in which are over 60,000,000 ties. Hardwood ties are preferred. Beech and oak are the most commonly used. Cluster pine, Scotch pine and spruce are also used. No ties are used without creosoting. The average life of creosoted beech and oak is 20 to 25 years. The pines give a life of 15 to 18 years, and spruce eight years. Very rough ties are accepted, particularly in oak, many being crooked, half round, irregular in shape and size. The annual requirements of the French railways are 6,000,000 ties. About 5,500,000 are produced locally and 500,000 imported, chiefly beech from Austria-Hungary and Turkey. The domestic ties are chiefly oak and cluster and Scotch pine.

A LOCOMOTIVE HEADLIGHT POSSIBILITY.—E. G. Fischer, chief of the instrument section of the coast and geodetic survey, department of commerce, has just completed the design and construction of a signal lamp which will be used during the coming summer in the mountainous regions of Idaho and Oregon on primary triangulation where the distance between stations is frequently as much as 100 miles. This lamp has been tested by the bureau of standards and is shown to be more than 150 times as powerful as the acetylene signal lamps which have been used for a number of years by the survey. These acetylene lamps have been observed with the telescope over lines more than 120 miles in length. The new lamp is an electric one, with a specially designed filament, and the power is the ordinary dry cell. While no tests have been made on the field with the new lamp, it is expected that ordinary haze or smoke will seldom prevent observations. The bureau of standards states that the larger sizes of this lamp are so powerful as to be scarcely comparable with the acetylene lamp.

Supply Trade News

Stone & Webster have moved their New York offices to the Equitable building, 120 Broadway.

The Baldwin Locomotive Works has moved its New York office from 50 Church street to the Equitable building, 120 Broadway.

S. C. Strock, who for a number of years represented Granger Lewis in the eastern markets, is now associated with J. L. Philips & Co., 32 Broadway, New York, dealers in lumber.

John Hopewell, of the firm of L. C. Chase & Co., 89 Franklin street, Boston, Mass., died at Washington, D. C., March 28. Mr. Hopewell had been associated with the firm since 1870.

M. D. Franey, master mechanic of the New York Central at Elkhart, Ind., has resigned to become superintendent of the Erie plant of the American Brake Shoe & Foundry Company, Mahwah, N. J.

Carleton D. Sperry, up to December, 1915, editor of the Railway Electrical Engineer and since then with the B. F. Goodrich Company, Akron, Ohio, has entered the railway sales department of the company.

G. I. Evans, formerly mechanical engineer, shop superintendent, at Montreal and later district master mechanic at Toronto for the Canadian Pacific, has been made general manager of the Imperial Iron & Steel Works, with headquarters at Collingwood, Ont.

Negotiations are reported as practically completed whereby an order for shells valued at \$84,000,000 will be divided among the American Locomotive Company, the Westinghouse Air Brake Company and the New York Air Brake Company on the basis of one-half to the Locomotive company and one-quarter each to the other two companies.

On April 1, Fairbanks, Morse & Co., Chicago, acquired control of E. & T. Fairbanks & Co., of St. Johnsbury, Vt. The stockholders of the latter company exchanged each share of stock (\$500) for three \$100 shares of 6 per cent preferred stock in Fairbanks, Morse & Co. The St. Johnsbury company will retain its corporate name, and Frank H. Brooks, its president, will continue to hold that position, although there may be some changes in the personnel of some of the other offices of the corporation.

The Ransome Concrete Machinery Company, Dunellen, N. J., has been reorganized and executive offices established at 115 Broadway, New York. F. L. Brown of San Francisco, formerly with the Washburn & Moen Company, the Western Power Company, and other large concerns, has been made president and general manager. E. L. Ransome, founder and creator of the concrete machinery business, has been made chairman and consulting engineer. On the new board of directors are G. F. Steele, general manager of the News Print Manufacturing Company of Chicago; H. K. Brooks, vice-president of the American Express Company; F. M. Smith, known as the "Borax King," identified with various business interests all over the West; H. M. Brittan, a constructing engineer; A. J. Norton, secretary of the company, and J. J. Givens, treasurer.

TRADE PUBLICATIONS

ELECTRICAL TESTING INSTRUMENTS. The Roller-Smith Company, 203 Broadway, New York, has issued a folder descriptive of its "S. S." type electrical instruments for signal system testing.

TRANSVEYORS.—The Cowan Truck Company, Holyoke, Mass., has issued a booklet describing and illustrating the Cowan transveyor or elevating truck. In transferring material by means of these trucks, the material to be moved having been piled on low platforms is transported without rehandling or repiling, or, as the catalog puts it, the Cowan transveyors "make the floor move." The booklet shows clearly how the trucks are used, by means of a number of views of trucks in use in various kinds of warehouses and shops.

Railway Construction

ALABAMA GREAT SOUTHERN.—A contract was let recently to M. M. Elkan, Macon, Ga., for second track work between Fort Payne, Ala., and Flanders, which are about 21 miles apart. The work will consist of paralleling the present line with a few slight revisions. (March 17, p. 527.)

ALEXANDRIA & WESTERN.—A contract has been given to W. J. Gilmore for grading work and to Henry J. Cox for the bridge work, it is said, on an extension to be built to timberland of the Long Pine Lumber Company. The company now operates a line from Alexandria, La., west about 15 miles. T. C. Lawless, president and general manager, Garden City, La.

BIRMINGHAM INTERURBAN DEVELOPMENT COMPANY.—The plans of this company call for building a line from Birmingham, Ala., northwest to Jasper 45 miles, including the construction of two steel bridges over the Locust and Mulberry forks of the Warrior river. Plans are also made for putting up terminals and wharves on the Warrior river. The company expects to develop a traffic in coal, iron, steel and passengers. W. A. Spencer, president, Wylam, Ala.; W. W. Shortridge, secretary.

CAMBRIA & INDIANA.—A contract has been given to A. L. Anderson & Brothers, Altoona, Pa., for grading work and track-laying on an extension to Nanty-glo in Cambria county, Pa., involving the handling of about 25,000 cu. yd. to the mile. The maximum grade will be 1 per cent and the maximum curvature 8 deg. The work includes the construction of 2 viaducts, about 300 ft. long, and several short plate girder bridges.

CENTRAL OF GEORGIA.—This company is building with its own forces a spur from the main line near Rossville, Ga., west to Alton Park, Tenn., about 2 miles. There will be one 150-ft. timber bridge on the line calling for 30,000 f. b. m.

CHESAPEAKE & OHIO.—A contract is reported let to Simon Curtis, Leehall, Va., to build a branch line from Williamsburg, Va., to the proposed site on the York river of a new powder plant for the E. I. du Pont de Nemours & Co.

INTERNATIONAL RAILWAY.—Plans are being made by this company, which now operates electric lines out of Buffalo, N. Y., to build an extension from the upper Grand Island ferry on the Niagara river to the wharf of the Wickwire Steel Company, 1.25 miles.

JOHNSTOWN & SOMERSET ELECTRIC.—This company is building an electric interurban line from Rockwood, in Somerset county, Pa., north via Milford, Somerset, Harrison, Belmont, Jenner, Boswell, Jerome, Holsopple, Davidsville and Kelso, to Johnstown about 36 miles. A section of about 4 miles to the center of Johnstown will be reached over existing tracks. Five miles of the line between Kelso and Davidsville has been graded. The company will build and put in operation the section of 10 miles from Johnstown to Jerome as soon as it can be completed. J. A. Vandegrift & Co., Inc., New York, has the contract to complete the line. Between Kelso and Boswell the maximum grade will be 5 per cent and between Boswell and Somerset 3 per cent. The maximum curvature will be 15 degrees. J. A. Berkey, president, and P. Armitage, superintendent of construction, Somerset, Pa.

MANHATTAN, TOANO & NORFOLK.—A charter has been given in Virginia to this company, with \$100,000 capital, to build the proposed line to connect Norfolk, Va., and West Point, about 67 miles. Dr. H. U. Stephenson, president, Toano; F. H. Sprague, Washington, first vice-president; A. W. Jennings, treasurer, Toano. (March 24, p. 703.)

NASHVILLE, HARTSVILLE & RED BOILING SPRINGS.—This company, which was recently organized in Tennessee with \$50,000 capital and headquarters at Nashville, plans to build a line from Hartsville, Tenn., in Trousdale county northeast to Lafayette in Macon county, about 12 miles. It has not yet been decided whether steam or electricity will be used for the motive power. The incorporators are J. C. Shofner, H. Andrews, P. Buxter, J. C. Collins, W. M. Long and J. M. Wilson. (March 3, p. 414.)

NEW YORK CENTRAL.—It is understood that this company contemplates resuming work on its new line around Albany, N. Y. The work includes the construction of a bridge across the Hudson river south of that city; the cost of the improvements will be about \$10,000,000.

SUGAR LAND RAILWAY.—This company, which operates a 32 mile line from Cabell, Fort Bend county, Tex., to Otey, has completed grading on an extension to Rotchsford, Brazoria county, 38 miles from Cabell. The existing line is via Sugar Land, Smada, Dewalt, House, Lochridge and Otey. The line crosses the Southern Pacific at Sugar Land, the International & Great Northern at House, and also the Santa Fe. It will connect with the Houston & Brazos Valley at Anchor. Track laying will be completed within 60 days.

VANDALIA.—A contract has been given to Dunn & McCarthy, Chicago, to build a new cut-off from Ben Davis, Ind., via Lebanon, to Frankfort, Ind., a distance of about 41 miles. The work will involve about 2,700,000 yd. of embankment, and approximately 250,000 yd. of excavation. The road will be built through a flat country, and the large amount of embankment will be required because separate grades will be provided at the crossings of all steam and electric lines, and all important highways. The cutoff will have an average grade of 3 per cent. There will be about 60,000 yd. of concrete masonry in 47 structures. About half of the masonry will be reinforced concrete and the rest plain concrete. It is uncertain whether any foundation piles will be needed. F. T. Hatch, chief engineer.

VIRGINIA ROADS (ELECTRIC).—According to press reports, plans are under consideration for the construction of an electric line from Williamsburg, Va., to the site of a proposed powder plant, about seven miles. E. G. Mercer and E. L. Mann, Richmond, are said to be interested.

WESTERN MARYLAND.—A contract has been given to the Miller Construction Company, Lock Haven, Pa., for building an eight-mile line from Hutchinson, W. Va., west along Binghamon creek to Wyatt. The line is to be built to develop coal fields. (October 29, p. 829.)

YOUNGSVILLE & JAMESTOWN (ELECTRIC).—It is understood that work will be started this spring on an electric line, to be built from Sugargrove, Pa., north to Jamestown, N. Y., about 10 miles. R. L. Davis, Jamestown, is said to be interested.

RAILWAY STRUCTURES

CABIN CREEK JUNCTION, W. VA.—See Charleston.

CHARLESTON, W. VA.—The Charleston Interurban Railroad has bought ground at a cost of \$17,000 for the site of a combined freight and passenger station to be built in Charleston. The new building will cost about \$2,500. The company also will put up a new station at St. Albans to cost \$6,000, and one at Cabin Creek Junction to cost \$2,000.

CHARLOTTESVILLE, VA.—The Southern Railway is making plans for improvements to be made to the passenger station facilities at Charlottesville.

CHICAGO, ILL.—The Chicago & North Western plans to extend its storehouses, Nos. 1 and 2, 100 ft. each, at the Crawford avenue shops. The additions will be built of brick, and will have a width of 50 ft. and a height of one story. It is estimated that the improvement will cost about \$90,000.

CHICAGO.—The Illinois Central will build a \$500,000 office building at Sixty-third street, near its passenger station.

NIAGARA FALLS, N. Y.—A company has been incorporated recently for the purpose of constructing a combined highway and railway bridge over the Niagara river at a point about midway between the whirlpool and Lewiston. A. J. Porter, Niagara Falls, may be addressed.

ST. ALBANS, W. VA.—See Charleston.

TORONTO, ONT.—A contract has been let by the Grand Trunk for the construction of a new steel bridge over its tracks at Bathurst street, Toronto. It is expected that the work will be started in May.

Railway Financial News

CHICAGO, INDIANAPOLIS & LOUISVILLE.—Directors are to meet on April 14 to arrange the details of a proposed \$40,000,000 first and refunding mortgage bond issue, and stockholders will hold a special meeting on April 24 to pass on the question of ratifying the action of the directors. The first important maturity of bonds on the Chicago, Indianapolis & Louisville is the \$1,160,000 5-year bonds which mature July 1, 1919. It is understood that the new issue will provide for expenditures of between \$2,500,000 and \$3,000,000 a year for additions and betterments.

CHICAGO, ROCK ISLAND & PACIFIC.—Judge Carpenter has given the receiver an extension of time to October 24, 1916, for the renewal or abrogation of contracts or leases.

LEHIGH VALLEY.—This company has sold to Drexel & Co., Philadelphia, \$10,697,000 general consolidated mortgage 4½ per cent bonds maturing May 1, 2003. The proceeds will be used for the purchase of additional locomotives, steel passenger cars, other equipment, and terminal construction and improvement work.

MISSOURI, KANSAS & TEXAS.—Judge Adams, in the federal district court at St. Louis, has issued an order appointing the United States Trust Company of New York in place of the Central Trust Company, as trustee under the first mortgage.

OREGON-WASHINGTON RAILROAD & NAVIGATION.—Kean, Taylor & Co. and Hambleton & Co. are offering \$3,000,000 first and refunding mortgage 4 per cent bonds, series A, of the Oregon-Washington Railroad & Navigation, guaranteed principal and interest by the Union Pacific at 86½, yielding about 4.75 per cent interest on the investment.

ST. LOUIS & SAN FRANCISCO.—Speyer & Co. announce that out of a total of \$46,384,000 general lien, 15-20 year 5 per cent bonds held outside of France, over \$42,500,000, or 92 per cent, have been deposited with the Bankers Trust Company.

Frederick Strauss, chairman of the refunding bondholders' committee, announces that over 96 per cent of the refunding bonds have been deposited with the Central Trust Company.

SOUTHERN PACIFIC.—W. B. Scott, president of the lines east of El Paso, has been elected a director, succeeding General Thomas H. Hubbard, deceased.

RAILWAY CO-OPERATION IN CHILE.—Following a recent agreement for interchange of traffic between the Chilean Northern Railway and the North Central System, a ministerial decree provides for general co-operation among the railway lines of Chile. Hereafter all railway companies must permit the junction of their own lines with those of other companies and must agree to facilitate traffic by the common use of the same tracks by selling through tickets to passengers and by offering through rates for freight; they must permit the construction of other lines to their own stations and of branches connecting lines from these stations with factories, mines and docks. Signed contracts will be made between connecting lines, stipulating the compensation to be received for the privileges granted.

"RAILROAD ACCIDENTS."—If not a rule had been broken last year by an employee of the Pennsylvania Railroad, if every order had been obeyed to the letter, if not a wheel or a bolt or a rail had failed—in short, if the millennium had been reached—still 16 people, classed as passengers, would have lost their lives on the road, says a report just issued. Three attempted to board moving trains; six jumped or fell from moving trains; four jumped or fell from ferry boats; one stood on the edge of a station platform and was struck by a train, and two stepped in front of moving trains at stations. Every one of these fatalities is counted in the Interstate Commerce Commission's reports as a "railroad accident," yet the railroad was powerless to prevent any of them. No passenger has been killed in a train accident on the road for more than three years.

ANNUAL REPORT

THE DELAWARE AND HUDSON COMPANY—EIGHTY SIXTH ANNUAL REPORT

GENERAL OFFICE.

NEW YORK, N. Y., April 3, 1916.

To the Stockholders of

The Delaware and Hudson Company:

The President and the Board of Managers submit the following statements of the affairs of your Company for the year ended December 31, 1915: The results from operation of the Coal Mining Department were:

Year.	Coal mined.	Revenues.	Expenses.	Net revenues.
1915	8,100,767 tons.	\$15,860,676.65	\$14,616,705.70	\$1,243,970.95
1914	7,400,695 "	15,517,041.94	14,553,052.94	963,989.00
Increase	700,072 tons.	\$343,634.71	\$63,652.76	\$279,981.95

†Excluding dividends received from stock of coal companies owned.

‡Excluding taxes.

The results from operation of the Railroad Department were:

Year.	Miles operated.	Operating revenues.	Operating expenses.	Net operating revenues.	Percentage of expenses to revenues.
1915	909.07	\$23,787,519.00	\$14,823,625.67	\$8,963,893.33	62.32
1914	903.99	22,722,961.55	15,188,850.92	7,534,110.63	66.84
Increase..	5.08	\$1,064,557.45	\$365,225.25	\$1,429,782.70	*4.52

*Decrease.

†The new classification of the Interstate Commerce Commission became effective as of July 1, 1914. The figures for the year 1914 have, therefore, been restated in order to place them on a comparable basis.

‡Excluding taxes.

RAILROAD DEPARTMENT.

REVENUES AND EXPENSES.

The general distribution of the operating revenues and of the operating expenses of the Railroad Department was as follows:

	1915.	1914.	Increase or decrease.
REVENUES:			
From Coal freight traffic.....	\$11,311,690.00	\$10,844,092.56	\$467,597.44
Merchandise freight traffic (including switching)...	8,788,365.15	8,133,605.44	654,761.71
" Passenger traffic.....	2,774,595.02	2,946,641.48	—172,046.46
" Express traffic.....	338,464.42	324,725.08	13,739.34
" Transportation of mails...	129,618.41	137,374.27	—7,755.86
" Miscellaneous sources...	444,786.00	336,524.72	108,261.28
Total operating revenues	\$23,787,519.00	\$22,722,961.55	\$1,064,557.45

EXPENSES:

For Maintenance of way and structures.....	\$1,852,166.23	\$1,721,506.76	\$130,659.47
" Maintenance of equipment.	3,703,382.44	3,680,235.32	23,147.12
" Traffic expenses.....	315,991.63	314,357.96	1,633.67
" Transportation expenses...	8,007,980.07	8,595,111.98	—587,131.91
" Miscellaneous operations...	190,758.14	136,891.62	53,866.52
" General expenses.....	775,645.74	760,178.35	15,467.39
Less Transportation for investment, Cr.....	Cr. 22,298.58	Cr. 19,431.07	Cr. 2,867.51

Total operating expenses\$14,823,625.67 \$15,188,850.92 —\$365,225.25

Net revenues from operation..... \$8,963,893.33 \$7,534,110.63 \$1,429,782.70

Percentage of expenses to revenues 62.32 66.84 —4.52

GENERAL INCOME ACCOUNT OF THE DELAWARE & HUDSON COMPANY, YEAR ENDED DECEMBER 31, 1915, IN COMPARISON WITH YEAR ENDED DECEMBER 31, 1914.

	1915.	1914.	Increase or decrease.
COAL MINING DEPARTMENT:			
Gross revenues.....	\$15,860,676.65	\$15,517,041.94	\$343,634.71
Gross expenses.....	14,616,705.70	14,553,052.94	63,652.76
Net revenues.....	\$1,243,970.95	\$963,989.00	\$279,981.95
Taxes accrued.....	467,932.98	323,102.21	144,830.77
Operating income.....	\$776,037.97	\$640,886.79	\$135,151.18
OTHER INCOME:			
Dividends and interest.....	704,762.42	717,068.64	—12,306.22

Gross income, Coal Department..... \$1,480,800.39 \$1,357,955.43 \$122,844.96

RAILROAD DEPARTMENT:

Gross operating revenues.....	\$23,787,519.00	\$22,722,961.55	\$1,064,557.45
Gross operating expenses.....	14,823,625.67	15,188,850.92	—365,225.25
Net operating revenues.....	\$8,963,893.33	\$7,534,110.63	\$1,429,782.70
Taxes accrued.....	680,119.39	671,119.13	9,000.26
Operating income.....	\$8,283,773.94	\$6,862,991.50	\$1,420,782.44
OTHER INCOME:			
Hire of equipment.....	\$142,489.15	\$70,610.41	\$71,878.74
Dividends and interest.....	879,983.60	1,006,156.29	—126,172.69
Miscellaneous items.....	50,591.52	41,522.83	9,068.69
Total other income.....	\$1,073,064.27	\$1,118,289.53	—\$45,225.26

Gross income, R. R. Dept..... \$9,356,838.21 \$7,981,281.03 \$1,375,557.18

DEDUCTIONS FROM INCOME:

Rentals.....	\$1,999,352.44	\$1,997,678.69	\$1,673.75
Interest on First and Refunding Mortgage bonds (1943).....	1,288,160.00	1,223,434.99	64,725.01
Interest on First Mtge. bonds (1917).....	350,000.00	350,000.00	.....
Interest on Debenture bonds (1916).....	558,920.00	558,920.00	.....
Interest on First Lien Equipment bonds (1922).....	433,935.00	433,935.00	.....
Interest on Divisional bonds.....	75,000.00	75,000.00	.....
General interest and discount..	135,585.80	170,854.53	—35,268.73
Total deductions.....	\$4,840,953.24	\$4,809,823.21	\$31,130.03

Net income, Railroad Dept.... \$4,515,884.97 \$3,171,457.82 \$1,344,427.15

GENERAL:

Miscellaneous income:			
Dividends and interest on securities owned.....	\$25,432.61	\$13,516.00	\$11,916.61
Rentals, real estate.....	25,717.05	25,895.51	—178.46

General interest and discount 98,154.29 50,703.42 47,450.87

Total income..... \$149,303.95 \$90,114.93 \$59,189.02

Taxes accrued..... 9,501.89 9,734.33 —232.44

Interest on Five Per Cent 20-yr. gold bonds, \$159,867.37

Less interest on proceeds..... 94,820.59

65,046.78 65,046.78

Total deductions..... \$74,548.67 \$9,734.33 \$64,814.34

Net income, general..... 74,755.28 80,380.60 —5,625.32

Net income carried to General

Profit and Loss..... \$6,071,440.64 \$4,609,793.85 \$1,461,646.79

14.28% on 10.84% on

Percentage to Capital Stock.....\$42,503,000.00 \$42,503,000.00

NOTE.—The new accounting classification of the Interstate Commerce Commission became effective on July 1, 1914. The figures for 1914 have, therefore, been restated in accordance with the classification in force during 1915, in order to render the data comparable.

FINANCIAL.

CAPITAL STOCK AND FUNDED DEBT.

The capital stock of The Delaware and Hudson Company on December 31, 1915, was \$42,503,000, no additional shares having been issued during the year.

On June 15, next, \$13,973,000, being the whole amount outstanding of the Convertible Four Per Cent Debentures issued in 1906, will mature and must be paid. Owing to the possibility of further complications of the financial market arising from the European war it was advisable to make early provision for this payment and, under authority of a resolution adopted at a special meeting of stockholders, held on September 30, 1915, an issue of \$14,451,000 Five Per Cent Twenty-Year Convertible Gold Bonds, dated October 1, 1915, and to mature on October 1, 1935, was made and disposed of and the proceeds are now in hand. These bonds will be convertible into stock of The Delaware and Hudson Company, during the ten years beginning with October 1, 1917, at the rate of \$1,500 in par value of bonds for ten shares of stock having the par value of \$100 each (with adjustment of accrued interest and current dividends), and the whole issue, but not a part thereof, may be called for payment at 105 per cent of its face value, and accrued interest, on October 1, 1922, or on any semi-annual interest day thereafter, subject to the right of conversion, if during the conversion period, at any time up to thirty days from the date of redemption fixed in the call. Proceeds of this issue, not required for redemption of the debentures maturing on June 15, 1916, will be available for additions and betterments, subject to the approval of the Public Service Commission for the Second District of New York.

SINKING FUNDS.

During the year there was paid to the Trustee under the First and Refunding Mortgage the sum of \$322,040, being one per cent of the par value of the First and Refunding Mortgage Gold Bonds outstanding on June 1, 1915, making the total paid to December 31, 1915, \$1,807,030. In accordance with the trust agreement, this sum has been expended in additions and betterments to the mortgaged property.

The amount paid to the Trustee under the First Lien Equipment Trust indenture during the year was \$650,000. The total paid to date is \$5,200,000, which has been increased to \$5,556,502.91 by accumulations to the amount of \$356,502.91 of interest on balances and investments. Complying with the agreement, bonds issued thereunder having a face value of \$357,000 have been purchased at a cost, including accrued interest, of \$362,896.77 and retired; \$2,539,374.80 has been expended for equipment made subject to the indenture, and securities and cash to the amount of \$2,654,231.34 are now held by the Trustee.

There was accumulated in the Coal Department sinking fund during the year, in accordance with the ordinance passed on May 9, 1899, and amended on May 10, 1910, \$233,385.41, \$5,000 of which has been applied to the purchase of coal lands and \$228,385.41 to reimburse the treasury for previous expenditures for the purchase of coal lands in Pennsylvania.

DIVIDENDS.

A dividend was declared on December 29, 1915, to be paid out of the accumulated surplus, upon the outstanding \$42,503,000 of capital stock, at the rate of nine per cent, amounting in the aggregate to \$3,825,270, payable during 1916, as follows:

- Two and one-quarter per cent to stockholders of record on February 26, 1916, payable on March 20, 1916;
- Two and one-quarter per cent to stockholders of record on May 27, 1916, payable on June 20, 1916;
- Two and one-quarter per cent to stockholders of record on August 28, 1916, payable on September 20, 1916;
- Two and one-quarter per cent to stockholders of record on November 27, 1916, payable on December 20, 1916.

COAL MINING DEPARTMENT.

The anthracite produced by this Company during 1915, including the product of washeries, aggregated 8,100,767 long tons, an increase of 700,072 over 1914. The year's output was 12.25 per cent of 66,122,062 tons, the total output of all Pennsylvania mines and washeries. The number of breaker hours required for the preparation of the Company's fresh mined coal was 51,213, an increase of 5,054 over the number required in 1914.

Three separate strikes during the year, caused temporary idleness at one or more collieries, the total loss being equivalent to closing one colliery for 62 hours or 6 8/9 working days. This compares with 4 6/9 days lost in 1914. The idle time in both years would have been avoided had the employees continued to work and permitted the differences to be adjusted in the orderly manner provided by agreement.

The agreement with employees, which took effect on April 1, 1912, will terminate on March 31, 1916, and ten demands, as to future wages and terms of employment, have been presented by mine employees, as follows:

1. That the next contract be for two years, commencing with April 1, 1916, and ending on March 31, 1918, and that individual agreements and contracts with miners be prohibited.
2. An increase of twenty per cent in all wages rates.
3. An eight-hour day for all day labor in and around the mines (in addition to the twenty per cent advance also demanded for these employees), with pay for overtime at one and one-half times and for Sundays and holidays at double the standard rates.
4. Recognition of the labor-union known as the "United Mine Workers of America, Districts Nos. 1, 7 and 9, Anthracite."
5. A "more simplified, speedy and satisfactory" method of adjusting grievances.
6. That no contract miner shall be permitted more than one working place.
7. That the selling prices of mining supplies be "more equitable and uniform."
8. That coal mined by the car shall be weighed and paid for on a mine-run basis, per ton of 2,240 pounds, including dirt and rock.
9. A readjustment of the machine mining scale.

10. That arrangements of detailed wages scales and settlements of internal questions, both as to prices and conditions, be referred to representatives of the operators and miners of the respective districts, to be adjusted on equitable bases.

Estimates show that acquiescence in the demand for an increase of twenty per cent in wages rates would alone add about \$23,000,000 to the cost of producing the annual output of Pennsylvania anthracite. This sum could not be taken from profits, for, according to the data for 1909 compiled by the United States Bureau of the Census, the whole difference between the annual value of the output (\$148,957,894) and the cost of production (\$134,245,600), not including in the latter any allowance for depletion of supply or any return upon the investment, was \$14,712,294. Moreover, if this \$14,712,294 be diminished by an allowance of five cents per ton of coal produced for the depletion of the supply in the ground (\$72,215,273 tons at 5c. = \$3,610,764), there is left only \$11,101,530 as the highest possible return to \$246,713,318 of capital which the Bureau of the Census states as the amount of the investment in anthracite producing property. This would be a return at the rate of approximately four and one-half per cent per annum.

RAILROAD DEPARTMENT.

OPERATING REVENUES.

The total operating revenues amounted to \$23,787,519, an increase of \$1,064,557.45, or 4.68 per cent over 1914; revenue from merchandise traffic increased \$654,761.71, or 8.05 per cent; revenue from coal traffic increased \$467,597.44, or 4.31 per cent; revenue from passenger traffic decreased \$172,046.46, or 5.84 per cent, and revenue from miscellaneous sources increased \$114,244.76, or 14.31 per cent. These comparative increases result, however, from the fact that the revenues of 1914 were abnormally low, not from any real advance over the revenues of a normal year. Compared with 1913, the total operating revenues of 1915 show a decrease of \$490,511.79, or 2.02 per cent; revenue from merchandise traffic a decrease of \$5,968.42, or 0.07 per cent; revenue from coal traffic a decrease of \$125,269.90, or 1.10 per cent; revenue from passenger traffic a decrease of \$503,428.66, or 15.36 per cent, and revenue from miscellaneous services an increase of \$144,555.19, or 18.75 per cent.*

The advances permitted by the Interstate Commerce Commission, in the "Five Per Cent" case, and other advances made at about the same time or slightly earlier, increased the operating revenues of 1915 over the total that would have been received at the old rates, according to the best estimates that are possible, by \$475,112.85. The advances authorized in the "Five Per Cent" case are estimated to have produced \$324,413.19 during 1915, or 1.99 per cent more than would have been received from freight without them; changes in passenger rates added, it is estimated, \$131,759.08, or 4.75 per cent; similar changes affecting incidental service produced \$18,940.58, or 2.07 per cent more. The aggregate of these increases amounted to 44.63 per cent of the increase in gross receipts over 1914, and to about one-half of one per cent (exactly 0.46) of the investment in the property used in the public service. These estimates rest upon records for the month of October, 1915, which were kept in obedience to a supplementary order of the Interstate Commerce Commission in the "Five Per Cent" case, and the assumption that the ratios of increases during that month from these causes existed throughout the year or, in the case of the increases in freight rates, during the period, beginning with February 21, 1915, when the new rates took effect. It should be borne in mind that the Commission refused to sanction any advances in rates on iron ore, bituminous coal, coke, rail and lake traffic or in rates covered by its own unexpired orders and that this Company did not propose any advances in anthracite rates. When the effort to obtain an adjustment of rates, in view of the diminished purchasing power of money, was renewed, the Commission having refused the advances sought in 1910, it was considered that a clear advance of five per cent was the least that would suffice to relieve the carriers' situation. The incomplete acquiescence of the Commission restricted the advance to barely two per cent of this Company's revenue.

The balance, amounting to \$589,444.60, of the increase was due to increased coal and merchandise traffic, largely a consequence of the stimulation of domestic industry by the abnormal conditions and demands of the European war. The lines of your Company participate only to a small extent in traffic to the port of New York and the production of the munitions of war in the territory immediately served by them is not of great magnitude, but they have participated to some extent in business of this character originating in New England and the movement of coal, ore and some other commodities has been enhanced to meet requirements that have sprung, primarily at least, from the abnormal activities of the current export trade.

Passenger traffic has quite generally decreased throughout the country, largely, it is considered, on account of extensive use of automobiles, both as pleasure vehicles and for public transportation. In this decrease the lines of your Company have shared. A special study with reference to the effect of the competition of motor-propelled passenger vehicles in the suburban region contiguous to Albany showed that receipts from the sale of all classes of tickets between Albany and Elmsmere, Delmar and Slingerlands, points at which there was such competition in 1915, fell off, as compared with 1914, \$8,353.41, which was 73.84 per cent of the total from such sales for the later year. At Voorheesville, Font Grove, Meadowdale and Altamont there is no such competition and the ticket sales between these points and Albany increased \$2,118.98, which was 10.20 per cent of the 1915 receipts. Similar comparisons as to tickets between Albany and Delanson, Cobleskill and Oneonta, showed an increase in sales of \$3,030.28, or 18.89 per cent, of the 1915 receipts. It is perhaps worth noting that 4,399 of this class of vehicles were licensed in Albany, Troy and the intermediate towns, and that if these vehicles should carry an average of as many as three passengers as much as twenty-five miles per day throughout the year, their total service, measured by the number of passengers carried one mile, would substantially equal the whole passenger business of your railway lines in 1915. Moreover, the Adirondack region, which contributes so largely to your passenger traffic, during the Summer months, suffered an unusual continuance of wet and cold weather, during the brief period of last year which should otherwise have been that of its highest attractiveness, and this made the decline in passenger traffic more marked.

OPERATING EXPENSES.

The decrease in operating expenses, as compared with the previous year, was \$365,225.25, or 2.40 per cent. Operating expenses amounted to 62.32 per cent of operating revenues, as compared with 66.84 per cent in 1914.

Expenditures for maintenance of way and structures increased \$130,659.47 largely on account of heavy renewals of ties and rails and increased charges incident to improvements in bridges.

Expenditures for maintenance of equipment increased \$23,147.12, principally because of increased freight train car repairs due to increased traffic.

Transportation expenses show a decrease of \$587,131.91, of which approximately \$187,000 was a saving in cost of locomotive fuel, due to increased train-loads and economies in its use; the remainder of this decrease is attributable to other economies from higher car-loads and train-

loads which have produced better results per unit of expenditure for wages of train crews and other purposes. These results have been obtained by means of capital expenditures, principally in the direction of securing more efficient motive power and conditions more favorable to the realization of its maximum potential efficiency.

The increase in the general expenses was caused, principally, by work necessary to meet the requirements of the Interstate Commerce Commission in connection with the Federal valuation of this Company's property.

SO-CALLED "FULL CREW" LAW.

The so-called "full-crew" laws, effective in Pennsylvania since July 15, 1911, and in New York since September 1, 1913, added \$143,561.66, to the operating expenses of the year, without obtaining any service to the public or to the Company. Of this total \$36,859.95 was incurred by reason of the Pennsylvania statute, and \$106,701.71 was due to that of New York. The total compares with \$155,142.62, and the respective items with \$37,351.79 and \$117,790.83 in 1914, the reductions in this statute-compelled waste having been by means of higher train-loads.

An effort to obtain relief from this wholly useless expenditure was made at the last session of the Pennsylvania legislature and resulted in the passage of a repeal bill, but it was vetoed by the Governor and the statute, therefore, remains unchanged. The effort will be renewed, at the next legislative session, in 1917. Similar efforts were made in New York and three bills were offered. One, for an unconditional repeal, made no progress; another, providing a repeal but placing control of the subject with the Public Service Commission, did not pass either branch, and a third, leaving the law unrepealed but giving power to the Public Service Commission to relieve railways from its provisions in special cases, passed the Senate, but was defeated in the Assembly. Renewed efforts are being made at the session now in progress.

The results of an inquiry conducted during July, 1913, before the "full crew" law of New York was enacted, show that a relatively small portion of the time of the train crews as they then existed was occupied by actual work. The following averages summarize the facts then ascertained, the words "time on duty" being understood to mean the whole interval between reporting for work and the hour of leaving, and the words "time actually engaged in work" to mean the time devoted to the physical or mental labor involved in the performance of the duties of the employment.

Item.	Passenger trains			Freight trains			Mine runs
	Through	Local	Branch	Through	Way or local	local	
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
CONDUCTORS:							
Time on duty per day....	7 40	7 50	12 09	10 33	10 50	10 00	
Time actually engaged in work.....	4 51	4 53	5 07	4 26	7 06	4 36	
Per cent.....	63.3	62.5	42.1	42.1	65.5	45.9	
BAGGAGEMEN:							
Time on duty per day....	7 19	7 46	12 09	....	....	....
Time actually engaged in work.....	3 20	2 59	4 01	....	....	....
Per cent.....	45.6	38.5	33.1	....	....	....
FLAGMEN:							
Time on duty per day....	7 51	7 51	12 09	10 33	10 50	10 00	
Time actually engaged in work.....	3 34	3 36	4 06	4 43	6 05	5 03	
Per cent.....	45.5	45.8	33.7	44.7	56.2	50.6	
HEAD BRAKEMEN:							
Time on duty per day....	....	....	9 23	10 33	10 50	10 00	
Time actually engaged in work.....	....	....	4 48	3 46	6 03	4 06	
Per cent.....	....	....	51.1	35.7	55.8	40.9	
MIDDLE BRAKEMEN:							
Time on duty per day....	....	....	....	10 16	*11 26	†12 17	
Time actually engaged in work.....	....	....	....	3 26	*5 48	†5 33	
Per cent.....	....	....	....	33.5	*50.8	†45.2	

*First middle brakemen on through freight trains.

†Second middle brakemen on through freight trains.

The foregoing figures demonstrate the absence of any genuine need for the additional man forced into the train crews by legislation.

OPERATING RESULTS JUSTIFY CAPITAL EXPENDITURES.

The average freight-train load of 1915 was 652.58 tons, an increase of 12.64 per cent over 579.34 tons, the average of 1914, and of 40.51 per cent over 464.45 tons, the average of 1910. Although the number of tons of freight carried one mile increased 4.25 per cent over 1914, and 15.95 per cent over 1910, there was a decrease in the number of miles run by freight locomotives of 12.40 per cent, as compared with 1914, and 7.26 per cent as compared with 1910. These data, in large degree, explain the reduction in the proportion of operating revenues necessary to meet operating expenses from 66.84 in 1914 to 62.32 in 1915 (if \$475,112.85 had not been gained, as already noted, by more favorable rates the economies in expenses would have reduced this ratio to 63.59), and the concurrence of an increase in operating revenues of \$1,064,557.45, with a reduction in operating expenses of \$365,225.25. They fully justify the additional capital investment represented by the heavier motive power and improved roadway and structures by means of which superior efficiency has principally been gained. It should be borne in mind that before this higher efficiency of the plant could produce these results it was obliged to overcome the reduced efficiency of labor. That is to say, the losses from increased wages rates, diminished service rendered, "full crew" laws, etc., had to be taken up before any improved showing could be achieved.

CAUSES AFFECTING INCOME.

INTERSTATE COMMERCE COMMISSION.

INVESTIGATION CONCERNING RATES, RULES, REGULATIONS AND PRACTICES IN ANTHRACITE.

During the year covered by this report the Interstate Commerce Commission concluded its inquiry concerning rates and practices in the transportation of anthracite and issued an order requiring very extensive reductions in the rates from the anthracite region to tidewater and other destinations directly reached by the railways on which the shipments originate, including stations on the lines of your Company as far north as Albany, Troy and Mechanicville. The original order required the new rates to be put in force on October 1, 1915, but, in recognition of practical trade difficulties that would attend such radical reductions in the midst of the trade-year, the effective date was postponed to April 1, 1916. Minor modifications in the rates originally fixed have also been made, the Commission having, as it is believed, become convinced that its original order went too far in disregarding long prevailing adjustments resulting from commercial conditions that ought not to be ignored. These modifications include advances of five cents per ton over the rates at first ordered to be put in force to Albany, Troy and Mechanicville. The order directs that the rates named shall be the maximum rates for a period of two years from the date on which it becomes effective. It is obvious that the changes which it commands will necessitate reductions at intermediate points not named and it is possible that adjustments at other points will become necessary. Estimates based upon the traffic handled during the year that

*In order to present these comparisons upon an accurate basis the data for 1913 and 1914 have been made to conform to the revised system of accounts, prescribed by the Interstate Commerce Commission, which became effective on July 1, 1914.

ended with June 30, 1915, indicate that the reduction in the annual revenues of this Company, resulting from the changes that this decision immediately requires, will amount to approximately \$374,000, or about 15.29 per cent more than the gain in 1915, from the advances that the Commission permitted by its order in the "Five Per Cent" case.

The action of the Commission, as stated in its opinion (35 I. C. C., 220-284), was based upon the conclusion that the industry of anthracite mining has not been as remunerative as the public interest renders desirable; that, therefore, a larger share in the delivered price of coal ought hereafter to accrue to those who own and operate the mines, and that the whole of the reductions required should be added to the sales value of the output when prepared and delivered to the railways for transportation. Whether the result desired by the Commission can be obtained by the means which it has sought to put into operation remains to be determined. It is not possible, however, to agree with the opinion of the Commission that public interest requires anything to be taken from the revenues of the anthracite railways, even though it should be found practicable to deliver the whole amount thus taken to the individual and corporate owners of mining property. Among the objections to this course are the following:

1. In the "Five Per Cent" case (31 I. C. C., 351), decided on July 29, 1914, the Commission found that:

"In view of a tendency toward a diminishing net operating income, as shown by the facts described, we are of opinion that the net operating income of the railroads in Official classification territory, taken as a whole, is smaller than is demanded in the interest of both the general public and the railroads; and it is our duty and our purpose to aid, as far as we legally may, in the solution of the problem as to the course that the carrier may pursue to meet the situation."

While the Commission gave an incompletely favorable decision in that case, more than the whole advance accorded to the anthracite carriers will be taken away by the decision in the Anthracite case.

2. The carriers whose staple traffic is anthracite are in a substantially unique position in their dependence upon an exhaustible product, every ton of this traffic diminishing the minable aggregate and bringing nearer the date of complete exhaustion. Although the complete cessation of anthracite movement is inevitably approaching, no traffic to take the place of hard coal is in sight or is likely to appear. This ought to have been given recognition in the determination of reasonable anthracite rates, for just rates must provide not only a fair return upon the present investment, but must safeguard that investment against this impending loss.

3. The anthracite railways expended, in actual cash, from 1907 to 1914, for extensions and improvements of their properties, the sum of \$434,344,536, but in 1914 their operating income was \$17,265,036 less than in 1907. This showing forces the owners of these properties to inquire whether incentive or justification for further developmental expenditures exists. Omitting the Pennsylvania System, the total gross receipts in 1913, from operating sources, of all the other railways serving the anthracite region was \$274,593,886.96, and no less than \$83,613,438.88 of this aggregate, or 31.18 per cent came from the transportation of anthracite. Disregarding their passenger business, which all authorities agree does not produce an adequate return upon the property used in the public service, 44.9 per cent of the remaining receipts of these companies was derived from anthracite. Therefore, to strike at the anthracite revenues of these carriers is to strike at the very heart of their business, and as they were built and exist mainly to serve the anthracite mining industry, such an attack is to impair the very foundation of their existence.

4. During the most satisfactory year of the last sixteen, 1907, the net corporate income for all anthracite carriers, after paying wages, other operating expenses, taxes and interest upon indebtedness, averaged only 7.41 per cent of the cost of their property, while in 1914 it fell to 5.06 per cent.

5. The receipts per ton per mile from anthracite carried by these railways do not exceed those from other traffic, the comparisons being based upon movements over similar distances.

All the foregoing, and many other, objections to reductions in the anthracite rates were fully laid before the Commission during the progress of its investigation.

Counsel for this Company were of opinion that the Interstate Commerce Commission did not have before it, when the order referred to was entered, any testimony sufficient to warrant its action as to rates to Delaware and Hudson destinations. It was considered, therefore, that, so far as this Company is concerned, the order was not binding and that on application to the proper tribunal a judicial decree enjoining its enforcement would issue. Notwithstanding this probability, it has been considered suitable, full weight having been accorded to the highly technical character of the legal considerations that would have to be relied upon in such a proceeding, to defer to the expressed purpose of the Federal Commission and to permit the rates which it has named to go into effect, at least until their practical results are ascertained. An application for a rehearing before the Commission, as to the rates to Northern New York, has been made and is now pending. The Commission denied a request to permit rates somewhat higher than those ordered (but as to the prepared sizes lower than those in force when the order was made) to be collected during the period prior to action upon the application.

EXPRESS RATES.

At the solicitation of the National Express Company an experimental change in the basis of payment for the services rendered to that Company has been agreed to for a period of one year commencing with January 1, 1916. The rivalry of the parcels post, conducted at an expense that exceeds its revenues, and by Federal officers upon whom rests no imperative obligation to obtain any different result, and the reduction of approximately sixteen per cent in express rates enforced by the Interstate Commerce Commission (although recently modified by the authorization of certain advances over the rates formerly required) have, as represented by the express company, led to considerable losses on its part and so modified the conditions which pertained when the existing contract went into operation on January 1, 1912, that a different arrangement has become necessary. These representations were apparently so far substantiated that it was deemed just and expedient to consent to the temporary and tentative substitution of a mileage basis of payment for the proportion-of-gross-receipts basis provided for in the existing contract. The basis of payment provisionally provided for prevails upon many of the larger railways, and so simplifies the methods of the express companies, in accounting for services and receipts, as to enable them to effect considerable savings in expenses. No substantial reduction in railway receipts from express business, attributable to this change, is anticipated, but should the results prove less favorable than the conditions warrant the experiment can be discontinued at the expiration of the period stated. It must be recognized that the action of the Federal government, in the matters referred to, has wrought fundamental changes in the express business and that all the changes are possibly not yet fully apparent.

RAILWAY MAIL PAY.

The Federal government continues to require your Company, and other railways, to transport the mails, including packages which have been diverted from express and freight traffic, to the parcels post, as well as other merchandise, printed matter, periodicals and letters, in passenger trains, at seriously inadequate compensation. Despite its protest the payments to this Company were fixed for a four years' period, beginning with

July 1, 1913, on the basis of the weight carried during the early months of 1913, when the maximum weight permitted in the parcels post was much lower than the weights that have prevailed since January 1, 1914. The continued expansion of this service on the lines of your Company, and of many other railways, has, as a result of this method, been without expense to the Government for the essential service of transportation, and a direct and confiscatory burden upon the use of the facilities which the owners of these properties have provided.

Moreover, the prolonged injustice in this particular threatens to be enhanced rather than remedied. The Joint Congressional Committee on Railway Mail Pay which, in obedience to the mandate of Congress, conducted for two years a most searching inquiry covering the conditions under which these railway services are supplied, recommended a substantial increase in the payments therefor, stating that—

"We believe our suggested rates are certainly not too high from a Governmental standpoint, though they may be too low from a railroad standpoint."

Nevertheless, the present Postmaster General and certain influential members of the House of Representatives have fought persistently for rates of payment still lower and more unfair than those now in force. Twice they have succeeded in obtaining a majority of the lower house of Congress, in favor of some form of reduction, the first measure having been defeated in the Senate, and the second, having been attached as a "rider" to the Act making appropriations for the expenses of the postal service, is now pending before that body. It is confidently believed that the latest measure, which was sanctioned in the House by the meagre majority of fifteen in a vote of 223, will be rejected by the Senate. This measure, if adopted, would substitute a variable and indeterminate basis of space occupied in cars by the mails for the basis of weight that has been in use throughout the whole development of the service and that must continue in use if the rates of payment are to continue to be comparable with the rates applied to other railway services. A still more threatening consequence would be to transfer to the Postmaster General, who would always be pleased to decrease the expenditures of his Department at the expense of the railways, all real power to determine the amounts to be paid to the latter while punishing with heavy penalties any railway which declined to perform any service required, however unjust the offered compensation. A most specious provision authorizes the railways—by joint action requiring such extensive co-operation in an almost certainly illusory proceeding that the effort to obtain it would probably be impracticable—to obtain a review by the Interstate Commerce Commission of the rates fixed by the Postmaster General, but negatives its apparent purpose by making the conclusion of the Commission recommendatory only and ineffective unless subsequently embodied in an Act of Congress.

The railways, through their Committee on Railway Mail Pay, have always been ready to accept any reasonable adjustment, although consistently favoring the present weight and distance basis and adhering to the view that with annual weighings and reasonable compensation for supplying compartments in which mails are assorted while in transit and for terminal and lateral services, the present system, with the admirable adjustment of its sliding scale so that the average rate per unit of weight diminishes as the volume of the mails increases, is the fairest to both the Government and the railways. Their efforts toward an acceptable compromise led to an offer to refer the whole question to the Interstate Commerce Commission, with plenary power to fix rates. This proposal was rejected, although no reason has been offered which explains why the agency which the Government has erected and endowed with authority to fix rates that must be paid by the traveling and shipping public and accepted by the railways, cannot be trusted by the Government itself to fix the rates which the Government shall pay for services which it demands. The Committee representing the railways will continue to work for a proper adjustment of this subject.

FEDERAL VALUATION.

The Interstate Commerce Commission has notified your Company that it intends to value its property as of July 1, 1916. In anticipation, your officers have made satisfactory progress in analyzing the accounts of the Company, as well as in the preparation of field notes and records, so that when the Government work is begun the Company's interests can be suitably protected. Full co-operation with the owners of properties leased to this Company will be necessary while this work is in progress, and is anticipated.

INDUSTRIAL DEPARTMENT.

Ninety-three new manufacturing or commercial establishments were located on the tracks of this Company during 1915. Proper efforts to attract such sources of new and additional traffic and to assist in the industrial development of contiguous territory are constantly in progress.

ADDITIONS AND BETTERMENTS.

The general program for renewing and strengthening the bridges on the main line, to make them capable of carrying larger locomotives, mentioned in annual reports for previous years, was continued during 1915, and there has been expended on this work, to December 31, 1915, \$417,480.94, of which \$169,426.22 was charged to additions and betterments, and \$248,054.72 to operating expenses. In addition, to accomplish the purpose of that program, it was found necessary to reinforce abutments and otherwise improve bridges as follows: Bridge No. 7.29 at East Windsor; No. 52.44 at Richmondville; No. 46.85 at Cobleskill; No. 24.28 at Delanson; No. 40.29 and No. 40.52 at Alplaus; No. 11 at Troy; No. 18.64 south of Mechanicville; No. 21.30 at Mechanicville; No. 45, No. 55.07, No. 55.28, No. 54.85, all at Fort Edward; No. 69.29 at Lake George; No. 84.69 at Clemons, and No. 134.29 at Whallonsburgh. There was expended on this work, to December 31, 1915, \$54,267.11, of which \$25,707.51 was charged to additions and betterments, and \$28,559.60 to operating expenses.

One span of Bridge No. 32.42 on the Ballston branch has been replaced, and another span removed and filled. This provided an undercrossing for the State highway, eliminating a grade crossing. There has been expended on this work \$12,971.43, of which \$5,101.79 was charged to additions and betterments, and \$7,869.64 to operating expense. A new bridge, No. 67.13, replacing one over the Champlain canal, near Fort Ann, has been erected to meet the requirements of the State in connection with barge canal work. The cost has been \$65,467.02, of which \$51,793.77 was charged to additions and betterments. Claim has been filed with the State of New York for a proper portion of this expense. A new concrete bridge to take the place of the plate-girder bridge washed out at Smith's Basin has been completed at a cost of \$13,879.97.

Consequent upon the operation of heavier power, renewing and strengthening culverts on the main line of the Susquehanna division, the Coopers-town and Susquehanna Valley, the Rutland and Washington branch of the Saratoga division, the Ballston branch and the Adirondack branch, has been started.

The installation of block signals between Plattsburgh and Rouses Point was completed during the year. The entire main line from Binghamton to Nineveh and Wilkes-Barre to Rouses Point is now equipped with modern block signals.

The development of yard facilities at Carbondale, mentioned in previous annual reports, was continued during the year, and \$70,574.45 was expended in connection therewith, all of which was charged to additions and betterments. The construction of additional tracks to serve the new washery at Providence, known as Marvine Breaker No. 2, was completed dur-

ing the year. The total cost of this work, all of which was charged to additions and betterments, was \$44,115.14. To facilitate handling longer trains and economical operation, the construction of extensions to passing tracks at East Worcester, Schenevus and West Richmondville, was authorized during the year. To December 31, 1915, \$12,061.56 was expended on these improvements. It is estimated that the total cost will amount to \$33,077.

The present Anthracite Park coal plant is to be removed to a new location at Duffy's Field, south of Carbondale, to make room for the extension and enlargement of the Carbondale yard. Work is in progress and property has been purchased to provide a coal storage plant of 190,000 tons capacity at the new location. The Anthracite Park coal plant had a capacity of 150,000 tons. The expenditure to December 31, amounted to \$179,490.33.

To effect fuel economies, the work of increasing the height of the smokestack at Mechanicville power plant, installing four additional boilers and making other changes, as mentioned in the annual report for 1914, has been completed, resulting in a total charge to additions and betterments of \$52,237.40, of which \$14,051.87 was expended during 1915.

A new passenger station has been erected at Bainbridge, and the old station moved to a new site and remodeled for use as a freight station. The total expenditure was \$16,339.16, of which \$15,520.17 was charged to additions and betterments, and \$818.99 to operating expenses. Work has been started on the improvement of the station building and a change of tracks at Granville, to be completed early in 1916. The estimated cost is \$12,600.

The elimination of a grade crossing at South Main street, Bainbridge, was commenced during 1915. The cost is estimated at \$36,500, one-half borne by your Company and one-half by the State. The construction of a new steel bridge, new culverts and changes in existing track arrangements and also 3,700 feet of new highway to eliminate three grade crossings in the towns of Castleton and Poultny, Vermont, is under way. This is in conformity with the law of Vermont, which provides that one grade crossing must be eliminated each year for each eighty miles of railroad in that State and brings the work of The Delaware and Hudson Company up to the allotment for 1914. It is estimated that the total cost will be \$37,150, of which the towns of Poultny and Castleton will bear thirty-five per cent.

Terminal facilities at Altamont have been improved to provide better for suburban passenger service out of Albany, at an expenditure of \$10,624.76, of which \$9,734.69 was charged to additions and betterments, and \$890.07 to operating expenses.

In order to accommodate the Pacific type locomotives, recently placed in service, alterations have been made in roundhouses at Rouses Point and Whitehall, at an expenditure of \$1,245.05, of which \$894.10 was charged to additions and betterments and \$350.95 to operating expenses.

The improvements at Albany, including purchase of additional lands, erection of general office building and freight terminal and construction of bulk-delivery and freight-house tracks, as mentioned in the reports for 1913 and 1914, had progressed sufficiently to permit their occupation and use during 1915. The location of the freight station facilities is advantageous on account of its proximity to the business district and to the boat landings. The general office building has been occupied since March, 1915. Its use has permitted concentration of the general offices and the surrender of leased accommodations that were formerly necessary. The Public Service Commission for the Second District of New York has rented and now occupies the old general office building.

Three eight-wheel steel-underframe cabooses and two steel-center-sill, double-truck, four-wheel cabooses have been received during the year and paid for from funds accumulated under the First Lien Equipment Trust indenture. Eleven combination baggage and mail cars and one full mail car have been rebuilt with steel underframes and trucks at a total cost of \$60,997.55, of which \$35,393.42 has been charged to renewals. The full mail car was converted into a baggage car.

Nine 72-ft. steel combination coach smokers, nine 72-ft. steel coaches with standard Pullman smoking-compartment ends, and six 60-ft. steel baggage cars, at a total estimated cost of \$305,000, are being built and will be paid for from funds accumulated under the First Lien Equipment Trust indenture.

One E-6 consolidation freight locomotive adapted to the use of powdered anthracite has been constructed and was placed in operation during March, 1916. The cost will be provided for out of funds accumulated under the First Lien Equipment Trust indenture. This experiment with powdered anthracite as a fuel for locomotives is the first ever undertaken and is of especial interest as, if successful, it will give a by-product value to what is now the waste-product of mining that goes into the culm banks and will demonstrate that the railway can make practical use of much cheaper fuel than is now employed. Other incidental advantages of convenience and economy are believed also to be among the possible results.

One 28,000-lb. capacity locomotive steam crane has been purchased for use in loading and unloading coal at the storage plant at Grassy Island wharfery near Olyphant. This crane will also be used for grading at Coal Storage plant. The cost was \$6,100 and has been provided through funds accumulated under the First Lien Equipment Trust indenture.

The application of super-heaters to locomotives and other improvements in motive power are being continued in accordance with the policy formerly adopted.

GENERAL REMARKS.

The conditions of the year 1915 have no parallel in history. The unprecedented conflict of arms that absorbed the energies of so large a portion of the world has made this country, at least temporarily, a source of supply for capital and commodities to which other peoples, especially the belligerents, have eagerly resorted. Purchases of commodities for export upon a large scale and at ascending prices have given stimulus not only to the industries directly affected, but indirectly to many others. The same extraordinary demand, in conjunction with certain financial operations incident to the war and changes in the banking system, brought about by the Federal Reserve system, have so augmented the funds available for new financing in the industrial field that extensive operations of that character, upon relatively favorable terms, have been permitted.

To a degree the railways, especially those serving the port of New York and the larger industries affected, have shared in the increased productive activity. The suddenly augmented volume of traffic has pressed heavily upon railway facilities and, by reason of the scarcity of ships for trans-Atlantic exports, the inability of consignees to receive and unload shipments and other highly abnormal conditions, there have been instances of traffic congestion which the carriers affected were temporarily unable to relieve. This has not happened without producing higher gross receipts but, notwithstanding this, the situation with regard to the capital requirements of the railways is scarcely less unsatisfactory than at the date of the previous report. A study of the yields upon railway and industrial securities, at recent market prices, indicates that the average investor is relatively still less willing than formerly to forego the advantage of the somewhat higher yield of the industrials for the sake of becoming the owner of bonds dependent upon railway property. He is apparently unable to find in the railway situation any offset for the fact that, unlike the prices of the products of the industrials, the prices of railway services are closely limited by law and custom and returns to investors sharply restricted in practice, and he turns without reluctance to the field in which

the laws of demand and supply are still unshackled and the rewards of economy and efficiency are restricted only to a just share of the gains which they secure. Hence the average prices of railway securities of the best class decreased, from 1903 to 1915, so that the average annual yield to investors at current prices grew from 4.10 per cent to 4.73 per cent, while that on industrials decreased from 5.69 to 5.44 per cent. In other words, capital for railway purposes became more costly, other capital became less costly. The increasing ability of the industrials to make their demand effective is found in the increased earnings of those companies and the ability of many of them to retire securities before maturity. These facts and the large amounts that the industrials have been able to spend to extend their facilities for the purpose of taking care of war orders and increased domestic business contrast sharply with the fact that at the same time, for want of funds, the railroads have been practically unable to extend their facilities. Capital can be obtained only from investors who are confident of receiving a fair return and adequate earnings can alone give this confidence.

The retardation of normal railroad development is strikingly indicated by the fact that, during 1915, only 933.24 miles of new line were added to the railway facilities of the United States. It is necessary to go back more than half a century and to the period of the Civil War to find another year in which less than one thousand miles were added to the country's railways. In 1849, when the railway system was still in its minority, 1,369 miles of new railway were constructed, and from that time to and through the year 1914, there were but three years, 1861, 1862 and 1864, in which the new construction was less than one thousand miles. Of the sixty-six years from 1849 to 1914, inclusive, there were five in which the new construction was more than 1,000 and less than 1,500 miles; eleven in which it was more than 1,500 and less than 2,000; eleven in which it was more than 2,000 and less than 3,000; nineteen in which it was more than 3,000 and less than 5,000; fifteen in which it was more than 5,000 and less than 10,000, and two (1882 and 1887) in which it exceeded 10,000 miles.

An especial difficulty attending efforts to finance new railway construction, extensions or improvements, at the present time, grows out of the burden imposed upon this country of absorbing a large volume of securities based upon domestic enterprises which are being sold to this market on account of the financial exigencies of the European war. This difficulty rests more heavily upon the railways than upon other corporate enterprises because a relatively larger proportion of their capital had been supplied by foreign investors. A very careful investigation, based upon statements received from all railways in the United States, having more than one hundred miles of line, indicates that between March 31, and July 31, 1915, American railway securities having a par value of \$480,892,135.01 were returned to this market. This figure is an understatement to the extent that securities formerly carried by domestic bankers or other agencies for foreign account have been sold and by reason of the absence of data as to bonds that are in default. The same inquiry showed, subject to understatement from the same causes, that on July 31, 1915, the following railway securities were held abroad:

Class.	Par value.	Market value.
Stock, preferred	\$236,151,600.00	\$196,092,423.26
" second preferred	5,608,850.00	2,115,414.75
" common	438,415,606.25	263,996,928.50
Notes	24,632,291.93	22,574,283.93
Debtenture bonds	160,288,700.00	141,444,592.50
Collateral trust bonds	180,590,850.00	136,422,185.75
Mortgage bonds	1,150,339,130.00	962,081,613.26
Equipment trust bonds	25,253,201.00	24,480,410.55
Car trust certificates	29,000.00	29,060.00
Receivers' certificates	2,201,000.00	2,201,000.00
Total	\$2,223,510,229.18	\$1,751,437,912.50

It will be noted that the par value of the securities known to have been returned during the four months period to July 31, 1915, equals more than one-fifth (21.63 per cent, to be exact) of the par value of those held abroad at its close. The situation in regard to the return of railway securities to this country has been further complicated by the plan of the British government for the so-called "mobilization" of American securities. The original announcement dated December 15, and published in the Gazette of December 21, 1915, began as follows:

"With a view to facilitating the maintaining of the exchanges between the United Kingdom and United States of America, the Lords Commissioners of His Majesty's Treasury are prepared to purchase American (including certain Canadian) dollar securities owned in this country, or to receive such securities on deposit for use as cover for short loans to be contracted in America."

The Gazette of December 24, 1915, contained a supplementary notice which concluded as follows:

"Holders of American securities are requested to remember that, although they are invited primarily to submit suitable securities under the present scheme, they can still contribute materially towards the achievement of the objects aimed at in the scheme by selling their securities in the open market and re-investing the proceeds in British government securities."

Scrutiny of the list of securities acceptable by the British government, under the foregoing plan, show that with few exceptions it consists of those issued by American railways. Under these conditions it must be realized that a very large share of that portion of the current American investment fund which would, in any event, be available for railway purposes, must, for the present, be diverted to the purpose of purchasing the railway shares and bonds which were formerly marketed in Great Britain and upon the European continent. The condition is one that ought not to be overlooked in connection with any study of the present and prospective situation of American railway enterprises.

The fact is not overlooked that during the year 1916, there will be required a relatively small amount of railway financing for refunding of existing obligations and exclusive of the amounts that may have to be raised for new construction and for additions and betterments. Exclusive of equipment trust obligations, the total par value of railway bonds maturing in 1916 is \$69,256,173, while the equipment trust obligations amount to \$46,303,255.50, making an aggregate for the year of \$115,559,428.50. The amount of bonds stated is almost exactly one-seventh of the amount of those that matured during 1915. Of course, these figures do not include anything for refinancing of insolvent railway corporations through reorganizations. Pending undertakings of this character involve a large aggregate, the railway mileage in the control of receivers having risen during 1915 to the highest total in the country's history. The total length of the railway lines in receiver's hands on December 31, 1915, was 38,661 miles and earlier in the year it was approximately 42,000 miles. These figures compared with 18,608 miles on June 30, 1914; 16,286 on the same date in 1913; 9,786 in 1912, and 4,593 in 1911. The highest total ever reported by the Interstate Commerce Commission was 40,819 miles, for June 30, 1894. Receivers' certificates outstanding on June 30, 1914, excluding those issued for properties earning less than \$1,000,000 per annum, amounted to \$36,066,000, and the present total is undoubtedly much larger.

By order of the Board of Managers,

L. F. LOREE,
President.